Girija and Viru Viraraghavan

Rose Breeder from Kodaikanal

Our Life's Work of Creating Roses for warm Climates

Indian Rose Annual - IRA 1980

Better Roses For India

M. S. Viraraghavan

A comparative newcomer in the field, I started hybridisation of roses in 1966. The hybridisation programme followed by me so far lays particular emphasis on two features: 1. petal texture, 2. heat resistance. With this in mind, the effort has been to evolve better roses for India by crossing such traditional varieties as Gruss en Teplitz, Cecile Brunner, Rose Edward, etc., which do well in the tropical heat, with imported varieties endowed with complementary qualities.

A detailed account of my work is available in the Souvenir brought out on the occasion of the First All India Rose Convention, January 1978.

In future also, I intend to persist with the same approach, with particular emphasis on producing a better yellow Hybrid Tea, and a dark mauve-purple Hybrid Tea, suitable for Indian conditions. Work is also being done on the evolution of roses in the hand-painted strain, as well as miniatures of better HT form and bushy growth in tropical warmth.

I have been asked by the editors to offer my comments on what should be done to promote rose-hybridisation in India. In my view, if rose-hybridisation is to progress in the country, it is essential that plant patent laws are introduced immediately. The Indian Rose Federation should take up this cause — as already stressed in my article contributed to the First All India Rose Convention, 1978.

Here are the descriptions of the ten varieties introduced by me so far:

HYBRID TEAS

1. KANCHI — 1976. Gruss en Teplitz x Unknown. This variety produces unusually large and full blooms in the richest shades of magenta purple on a strong bushy plant. Mr. Kasturi Rangan of K. S. G. Son states that this variety is likely to become a standard one for rose garlands in tropical India. It has a tea fragrance.
2. KOVALAM — 1976. (Amberlight x Traumland) x Western Sun. The rounded buds are light amber in tone and open to unusually fragrant double flowers of white shading to cream and amber in the centre.
3. DHARMAPURI — 1978. First Prize x [(Gruss en Teplitz x Unknown) x Samurai]. The flowers are an eyecatching shade of brick red blending to rose red with unusual flower form — clearly the contribution of First Prize.
4. VANAMALI — 1979. Lady X x ([(Gruss en Teplitz x Unknown) x Lake Comer] x Angel Face), Bred with the warm tropical climate in mind this lilac H. T. bears exceedingly well shaped buds of pure dark mauve which open to large high-centred flowers of orchid lavender. Of interest to exhibitors is the feature that the colour and form hold very well under refrigeration.

FLORIBUNDAS

5. FIRST OFFERING — 1973. Unknown Pink Tea Rose x Samba. This is one of the few modern roses raised from a direct cross with a Tea rose. From the Tea parent the variety has inherited tolerance to warm climate and freedom of flowering. The dwarf habit of growth and excellent petal texture are the features of the variety, as well as the colour which is dark red, but very bright.

6. MAHADEV — 1975. Gruss en Tepiitz x Unknown. One of the brightest in the vermillion orange range, the plants are bushy and foliage quite disease resistant. Has the unusual characteristic of producing the brightest coloured blooms during the monsoon period.
7. KADAMBARI — 1976. Little Darling x [Gruss en Tepiitz x (Honey Favourite x Unknown)]. This floribunda has unusually coloured flowers of pastel orange edged lac red with the centre and reverse ivory. The colour which gradually darkens remains bright to the end.
8. BHAGMATI — 1977. Charleston x [Roman Holiday x (Flamenco x Gold Gleam)]. The buds are a spectacular shade of anthurium scarlet with ivory white reverse opening to lovely bicolour blooms of claret red with golden centres. The petal texture is extraordinarily good and the bright green foliage very healthy. Flowers freely even in the height of summer. No fragrance.
9. AMRAPALI — 1979. (Amberlight x Traumland) x Honey Favourite x (Gruss en Tepiitz x Unknown). This is an advance in pink floribundas. The ovoid buds are rose pink opening to fully double flowers of salmon pink shading to amber towards the centre, with the petal edges lightly touched lilac in cool weather. Unusual vigour and disease resistance. Fragrant.

CLIMBER

10. KANYAKUMARI — 1978. Little Darling x [(Gruss en Tepiitz x Unknown) x Montezuma]. This climbing rose flowers freely on the Indian plains, as every shoot that is produced ends up with a flower or a cluster of three, of attractive salmon pink shaded orange flowers. No fragrance.

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One of the most popular colours in roses is vermillion orange — the colour of the pomegranate flower. In fact, such is its popularity that hybridisers have evolved a bewildering variety of every shades of vermillion ranging from rich dark shades verging on scarlet red to the most subtle tints of salmon. But amidst this diversity we may tend to forget that this range of colour is of a comparatively recent date.

Basically, the vermillion colour is derived from the pigment, pelargonidin. The genes for production of this pigment, arose by a chance mutation — earlier roses lacked vermllion because the standard rose pigment, cyanidin, can produce colours only in the red and pink shades. The first roses with pelargonidin colours were the sports Gloria Mundi (1929) and Paul Krampel (1930), both derived from the famous polyantha, Orleans Rose. A similar mutation which arose a little later when the hybrid Moschata Eva (Kordes 1933) was crossed with a red H. T. led to the production of the Floribunda, Baby Chateau (Kordes, 1936) which was destined to play a definitive role in the evolution of roses—for the cross Baby Chateau x Crimson Glory led to the production of the first Vermillion H. T. Independence •—and many subsequent developments in this line originate from that variety, which combines a striking new colour with the genes of that most famous of red roses, Crimson Glory.

The opportunity afforded by the appearance of such a startling colour break as Independence, (still after 30 years one of the most striking of roses) and its progenitors Eva and Baby Chateau, was eagerly seized by many eminent hydridisers — Kordes himself (Germany), his famous compatriot Tantau, Meilland (France), McGredy (U.K.), Boerner (USA) and a host of others throughout the world. Progress was achieved almost simultaneously in two directions towards an ideal of a large flowered vermillion H.T., and towards a better vermillion Floribunda.

As you would have noticed from the parentage, Independence, itself derived from a cross between H.T. and a Floribunda, does not fall strictly into either category, and is in fact regarded variously as H.T., Floribunda or Floribunda/H.T. type in different countries.

Taking the developments on the H.T. side first, hybridisers have been attempting to increase the flower size, while at the same time eliminating the objectionable features of the new strain, for instance, the tendency of the colour to fade or blue in an unaesthetic manner.

A famous series of crosses by Meilland, between Peace and Independence and Happiness and Independence, led to notable success in this direction. Roses like Soraya, orange red, reverse crimson, (Peace x Floradora x Grandmere Jenny), 1954; Allegro, also geranium red (Happiness x Independence x Soraya), 1962, were among his most famous early vermillion roses. Till recently Baccara was the most popular cut flower variety in this colour and was superseded only in the 70's by Meilland's own Inter-flora (also called Interview 1970), and thereafter by the salmon Sonia (1970).

But even more significant advances were made by Tantau. While initially he also started with Baby Chateau, a Floribunda Alpine Glow was also used, as well as a series of crosses involving various species, such as Rosa roxburghii. One of the most important parent roses raised by Tantau (in shades of cinnabar red) was the Floribunda Floradora (Baby Chateau x R. roxburghii). Floradora was the base for the evolution of the Grandiflora class of roses. The premier seedling of this series was Queen Elizabeth (Charlotte Armstrong x Floradora) but more important from the point of view of this article is the famous pinkish vermillion H.T, Montezuma (Fandango x Floradora), Swim, 1955. This remains till today one of the best roses for a warm tropical climate. Coming back to Tantau's own line of research, the climax was reached with Super Star — its colour derives from Alpine Glow, and flower form, size and vigour from Peace and is till today, the supreme development in this colour. I still remember the incredulous surprise with which I and so many other visitors to the 1960 Delhi Rose Show gazed at Super Star when it was exhibited, perhaps, for the first time in India.

The originator of Independence, Kordes, was meanwhile working steadily towards slightly different goals and, as a result of his efforts, we have roses like Colour Wonder, salmon orange with paler reverse (Perfecta x Super star) 1964, which have proved a virtual gold-mine for hybridisers.

Apart from Super Star, the next land-mark in the development of vermillion roses was again by Tantau when he produced Fragrant Cloud in 1964. The full parentage of this extra-ordinary variety, which combines a lovely flower form with a colour ranging from geranium red to coral red, and perhaps one of the most exquisite of rose perfumes, has not been revealed, but it is obviously a seedling in the same Super Star strain to which has been combined Peace blood via Prima Ballerina. This, and its close relative, Duke of Windsor, which is slightly more orange, still remain as the acme of fragrant vermillion coloured roses — though, unfortunately, the disease resistance is not really what it should be.

The second mainstream of progress in vermillion roses was towards better Floribundas with an emphasis on. those with H.T. form. The significant break in this line was Fashion (Boerner 1949), involving a cross between the Floribunda Pinocchio and the H.T., Crimson Glory, Pinocchio is derived like

Baby Chateau from Eva. From Fashion, Boerner got Spartan (1955) by crossing it with Geranium Red.

The opportunity afforded by Spartan was seized by McGredy to produce a series of beautiful Floribundas in the same colour range including varieties like Flamengo (Cinnabar x Spartan) I960, Mischief (Peace x Spartan) 1961, Elizabeth Of Glamis (Spartan x Highlight) 1965, City of Leeds (Evelyn Fison x Spartan x Seedling) 1966, Irish Mist (Orangeade x Mischief) 1966, and innumerable ethers.

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Thus, by the early 60's, a very high standard had been reached both in H.T.'s and Floribundas. Thereafter, constant efforts to further improve the strain were made. One of the earliest successes was Gregory's Summer Holiday (Super Star x Unknown) 1967, which is still a very good rose for India.

Tantau, himself, has striven hard to better Super Star and his Elida (1966) and Love Story (1973) are obvious attempts. But alas, at least in Hyderabad conditions, they appear more as steps backward. Likewise, efforts to better Fragrant Cloud in the H.T. range have not prospered. But, Fragrant Cloud has helped to produce good roses in other colours.

Others, who have built up on the Super Star/Fragrant Cloud H.T. strain are Harkness with Alexander (1972) too thin a flower for warm climates, Lindquist with Command Performance (1970), Kordes with Feurzauber (1974) — a lovely flower, but an indifferent grower in Hyderabad, and Dickson with Coalite Flame, (1974), one of the largest of the vermillion roses but with a tendency to produce split centres. In the U.S., Warriner has introduced Futura (1974),but this again is hardly an advance, atleast as far as India is concerned. On the floribunda side too, there have been repeated efforts to improve, including a series of dwarf vermillions exemplified by Tantau's Topsi (Fragrant Cloud x Fire Signal) and Le Grice's Warrior (1977). A series of vermillion Floribundas of startling brilliance have been introduced by McGredy beginning with City of Belfast (1968) and continuing through to Trumpeter (1976) and Captain Cook (1977). Ginger Snap (Delbard 1978) and Memento (Dickson, 1978) must also be noted.

A further approach to the breeding of vermillion roses involves the use of Colour Wonder, and one of the most spectacular successes is Cocker's floribunda Anne Cocker (Highlight x Colour Wonder, 1970). I should also mention the Grandiflora Prominent (Colour Wonder x Zorina). But ultimately the conclusion' remains that the triumphant march achieved in the 50's and early 60's has not been maintained. I particularly refer to progress in H.T.'s. But there are many contenders such as Dora (Gaujard, 1975) Corso (Cocker 1976), Margaret Trudeau (McGredy 1976), Cayenne (Warriner 1977), Raja Surinder Singh (Dr. Pal, 1977), Ambassador and Alpha (Meilland, 1978).

Perhaps a more sophisticated approach is needed. Concentration has been very much on the obvious. While undoubtedly vermillion is a striking colour, a certain danger is inherent in merely striving for brighter and brighter shades. Beyond a point the eye of the beholder is satiated rather than elated by the unceasing stream of scarlet roses. Further, much needs to be done to improve the health of the strain, particularly of the H.T.'s. Super Star, apart from an ungainly habit of growth, has become noticeably subject to mildew and Fragrant Cloud was always addicted to Black-spot — and these defects are disconcertingly repeated in their progeny. Of course, while the stream of strident vermillion roses (perhaps meant as potboilers), continues unabated, the more discerning hybridisers have not been slow to realise the necessity for a modified approach. The eminent English hybridiser, Le Grice, has been trying to marry the bright vermillion hues with the lilac brown range, and has produced a series of beautiful roses—floribundas like Tom Brown, Saturn Red (1964), and Vesper, mars orange, (1961); IARI's lovely brownish orange Mohini represents a further step in this evolution — that of a vermillion verging on a golden brown rose. But as yet, no typical H.T. has appeared.

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New Approaches to Rose Breeding – The Arisumi Papers

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During the period 1964-1968, the eminent Japanese biochemist, Dr. Kanichi Arisume, published a series of four papers entitled ‘Studies in the Flower Colours in Rosa’ with special reference to biochemical and genetic analysis, and the application of these results to practical breeding. These papers, which represent a masterly synthesis of the subtleties of biochemistry and their application to rose breeding have remained relatively unknown to rosarians, though their content and importance is such that they deserve to be a part of their essential knowledge. This article is an attempt to present from a layman’s point of view the main features of these papers, their significance to practical rose-breeding and some further speculations on the theme.

Before dealing with the papers, it is necessary to briefly discuss the various pigments which are responsible for the colours of flowers. All red, orange and blue flowers generally derive their colour from water soluble pigments occurring in the aqueous cell sap, called ANTHOCYANIDINS. The three important anthocyanidins are:

1. PELARGONIDIN - present in orange red to scarlet flowers e.g. scarlet pelargonium (geranium), orange red dahlia or vermillion roses like ‘Super Star’.
2. CYANIDIN - present in crimson to bluish red flowers, e.g. deep red dahlia, red roses such as ‘Papa Meilland’.
3. DELPHINIDIN - present in violet to blue flowers such as delphinium.

Apart from these three basic anthocyanidins there are certain other derivatives which are responsible for modified flower colour: in other words, various shades of red, vermillion, and blue. A number of other factors also influence the colour of anthocyanidins, e.g. iron salts intensify the colour, the pH of the cell sap, presence of tannins, organic acids and enzymes also play a part.

Other than anthocyanidins, there are a number of different pigments, such as FLAVANOLS (e.g. the colouring matter of the pale yellow China Rose ‘Mme. Falcot’), and carotenoid pigments (the colouring matter in carrots, or dark yellow roses), which are responsible for the white and yellow to brown range of flower colours. These pigments may be co-existent along with anthocyanidins with a consequent modification of the pure anthocyanidin colour range. It should also be noted that in many flowers the colour changes with the age of the bloom e.g. the colour change from yellow to red of the rose variety ‘Charleston’, and this is due to the modification of pigment composition during the ageing process.

In the light of the above, we may analyse the colours of roses as follows: Prior to 1900 there were only red (including pink), white and light yellow roses. The red and pink roses, e.g. the Hybrid Perpetuals, owed their colour to the presence of cyaniding; while the pale yellow colours, e.g. of the Tea roses were due to the presence of various types of flavonols. Initially the Hybrid Tea roses produced by crossing the Hybrid perpetual and the Teas had also the same colour range. But in the early years of the century (20th) the famous French hybridiser, Pernet Ducher, succeeded in crossing the then existing rose varieties into the bright yellow rose species *R. foetida* (Persian Yellow); thereby the colour range of roses was greatly increased, because Pernet Ducher’s cross brought in the genes for the production of the carotenoid type of pigment. All the bright yellow roses of today ultimately owe their colour to the original cross made by him.

A second major landmark in the development of rose colour was the introduction of genes for the production of pelargonidin in roses. This occurred around 1930 and all today’s vermillion or scarlet roses e.g. ‘Super Star’, owe their colour to pelargonidin.

As such we can see that the colour of modern roses is derived from CYANIDIN (red) and PELARGONIDIN (vermillion) as modified by the presence of various types of FLAVONOLS (pale yellow) and CAROTENOID pigments (dark yellow).

But prior to Arisumi’s work it was believed that it was not possible to have a blue rose based on the pigment DELPHINIDIN, as this pigment was not present in any of the rose species. One of the most sensational aspects of Arisumi’s work is the discovery for the first time of delphinidin in a rose. But I will deal with this in greater detail later.

The standard procedure adopted by Arisumi in his researches was to extract the pigments in various rose species, as well as in varieties belonging to different groups e.g. Teas, Hybrid Perpetuals, Gallica roses etc. and to separate the pigments into different types adopting the method of paper chromatography. The pigments present were identified; thereafter deductions were made on the genetic composition of the various classes of roses in the light of pigment composition. Without going into too much detail the analysis carried out by Arisumi showed that the pigment in species roses was Cyanidin. But there were quite a few rose species containing other anthocyanidins such as PAEONIDIN and the modified cyaniding, CHRYSANTHAMIN. Most rose species also contained flavonols which were broadly divided into the KAEMPFEROL and QUERCETIN types. It is interesting to note that so many rose species contain paeonidin including the bicolour variant of *R. foetida*, *R. pomifera, R. californica, R. nitida, R. rugosa and R. stellata* variety *mirifica* in which significantly it is the only anthocyanidin present.

The analysis of pigments in garden roses showed a remarkable difference in the anthocyanidin constitution in Hybrid Teas and Floribundas, even though both are derived from the common ancestor species*, R. chinensis.* While the Floribundas had retained the original *chinensis*, i.e. Tea rose genes more or less intact, the Hybrid Teas, though they are the result of crosses between Hybrid perpetual and Tea roses, had largely the genetic composition of the Hybrid Perpetual – in other words, that of the tetraploid ancestral types such as Damask and Gallica roses, natives generally of the continent of Europe. As readers may have noted, one of the most interesting features of the Chinensis type of rose is the colour changing characteristics - originally of *R. chinensis mutabilis* and of which there are numerous examples in the Floribunda class, starting from ’Masquerade’ and including ‘Charleston’ and many others.

The analysis of this pigment change showed that the colour variation occurred on account of the synthesis of a modified anthocyanidin (technically, formation of 3-monoside type anthocyanidin) as the flower developed from bud stage to the fully open stage. This feature was, at the time of the papers, confined to the Floribunda class, and Arisumi has pointed out that this is one more confirmation of the Floribundas containing the *Chinensis* type of gene which was lacking in the H.T.s.

Other major differences which Arisumi noted were the relative absence of pelargonidin in the Hybrid Tea class whereas a large percentage of the Floribundas contained pelargonidin. Again, many of the H.T.s studied had carotenoid type of pigments though the occurrence of carotenoid was much less frequent in Floribundas. In other words, Arisumi’s conclusions support the common observation (again, more valid during the 1960s when his papers were written) that there are many more vermillion coloured Floribundas than H.T.s , but on the other hand, very few yellow Floribundas. In fact till today, the yellow Floribunda is a comparatively weak class.

So far we have dealt with the general features of Arisumi's work. Four very important propositions of great interest to rosarians and particularly rose breeders arise from his work, and I will deal with these individually below.

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Arisumi points out that the answer to this question lies in selective breeding with a view to produce such H.T.s which contain the genes for the formation of 3-monoside type anthocyanidin – both of the cyanidin type also the hitherto unknown and much brighter pelargonidin type (callistephin). As noted earlier, this ability originating from *R. chinensis mutabilis,* is already present in the Floribunda class. Arisumi had predicted in 1964 itself that if this feature could be transmitted to the H.T. class we would have very interesting results. Rosaraians will note that it is only in the last few years, that is, well over a decade after Arisumi made the suggestion, that such roses have appeared in the H.T. class. I am referring to roses like 'Spellbinder' (Warriner 1975) which changes in colour from ivory to pale pink to almost crimson at the fully open stage; and the varieties 'Colour magic' (Warriner 1978) and 'Double Delight' (Swim & Ellis 1977). While 'Double Delight' changes from creamy white at bud stage to strawberry red, American commentators have remarked that 'Colour Magic', while changing colour basically from white to dark pink, changes in colour almost every hour after the bud has opened!

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Colour changing apart, I feel that the capacity to synthesize 3-monoside type anthocyanidin could be harnessed to produce a non-fading red H.T. which has long been the dream of rosarians. Attempts in this direction by introducing pelargondin to boost the colour stability of the cyaniding red or by inter-crosses with yellow roses generally lead to beautiful red H.T.s completely lacing in the scent which rosarians rightly expect from a rose of that colour; for example, 'Christian Dior' or 'Samurai'. On the other hand, dark red H.T.s with fragrance generally tend to fade or 'blue' as they age - apart from usually being addicted to mildew.

A second approach to non-fading red colour is also suggested by the Arisumi papers, which I will deal with later.

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This is the famous proposition which is referred to by Dr. B. P. Pal in his well known work, *The Rose in India*, and which, in fact, started my search for the Arisumi papers. Arisumi's conclusion is that it is quite feasible to produce roses of such a type and he predicts in his papers that such roses will have a brilliance of colour not known in roses till then. I should again remind readers that this was a statement made around 1964. Thereafter such roses appeared in which the brilliance of pelargonidin is greatly intensified by the presence of carotenoid (my speculation!). I refer to roses like the H.T. 'Whisky Mac' or the incomparable Floribunda 'Belinda' – a pure golden vermillion, which are examples of the kind of achievement realized in recent years, envisaged so far back as Arisumi did.

But even more important than the results achieved so far is the guideline provided by Arisumi's work on how to achieve such a result. He points out that pelargonidin tends to co-exist with the Kaempferol type of yellow rose but is not normally found with the Quercetin kind. As mentioned earlier, Kaempferol and Quercetin are flavonols present in a number of rose species and varieties and generally found in most yellow roses in combination with the carotenoid type of pigment. Arisumi showed that while roses of the type of 'McGredy's Yellow' (1933) belong to the Kaempferol type, others like 'Lydia' (Robinson 1949) belong firmly to the Quercetin category. Crosses between 'McGredy's Yellow' and various vermillion roses carrying the pelargonidin gene resulted in a high proportion of the seedlings containing pelargonidin. Conversely, similar crosses with 'Lydia' led to the elimination of pelargonidin in the resultant seedlings.

Apart from the typical Quercetin and Kaempferol type of yellow roses there are others which fall into an intermediate category. Arisumi refers to the variety 'E. J. Baldwin' (Robinson 1952) in this connection. Here again his work is a little dated by now. But it is easy enough to deduce which of the present day yellow roses belong to the Quercetin or Kaempferol type, by referring to the parentage of modern vermillion roses. Clearly, 'Peace' which is one of the parents of 'Super Star' belongs to the Kaempferol type. There can be little doubt that the

Arisumi procedure, if consciously followed, could lead to a great acceleration in the production of roses in which pelargonidin co-exists with the carotenoid type of pigment.

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This is again referred to by Dr. Pal in his book. Arisumi's work shows that apart from the cyaniding pigment there are a number of rose species and a few varieties which contain the modified cyaniding type of anthocyanin, paeonin. He points out paeonin produces a red much more brilliant and much less prone to fade, than cyaniding. As referred to earlier, there are a large number of rose species, including *R. foetida bicolour, R. rugosa* etc., which contain paeonin. *R. stellata* in fact contains paeonin as the sole anthocyanidin. The Floribunda varieties, 'Piccolo' (Tantau, 1957), 'Red Pinocchio' (Boerner, 1947) and 'Ruby Lips' (Swim, 1958) also contain paeonidin; Arisumi points out that the latter two contain also the genes for synthesizing 3-monoside. There can be little doubt that if the rose breeder is able to combine the genes for the production of paeonidin and that for the formation of 3-monoside in a rose of typical H.T. form he would have taken a giant step forward in producing the perfect red rose.

4. **The fourth proposition which flows from Arisumi's work is the question: How do we produce a blue rose?**

As readers would be aware, basically a blue rose would be most obviously possible only if the genes synthesizing the anthocyanidin, Delphinidin, were to be introduced in modern roses. Even though Arisumi established as far back as 1968 that delphinidin was in fact present in certain roses, chiefly in the young leaves of the Floribunda 'Samba' (Kordes, 1964), this fact has largely remained unnoticed. I have only seen a passing reference to this sensational finding in an article on the subject of 'Colours in Roses' in the 1980 Rose Annual of the Royal National Rose Society (by Roberts and Humphrey).

But generally, most rose literature till this day dismisses - incorrectly - the fact of delphinidin being present in the gamut of rose species and varieties, and talks only of other and far less obvious procedures for evolving a blue rose. Arisumi's painstaking analysis of the pigment composition of the young leaves of 'Samba' showed beyond doubt that delphinidin was present, though in small quantities. ('Samba' leaves contain 15% delphinidin and 80% cyaniding, the balance being other anthocyanidins). Arisumi has pointed out in his paper that the dream of the blue rose could be realized if, through selective hybridisation, the delphinidin concentration could be so increased, that it appears in the petals also. From the chemistry point of view, pelargonidin, cyanidin and delphinidin represent a series of anthocyanidins – pelargonidin having a single hydroxyl (OH) group, cyaniding two, and delphinidin, three. Arisumi says conditions are more favourable for hydroxylation in the leaves rather than on rose petals. As such it is easier to have pelargonidin in the rose petal and delphinidin in the rose leaf. But he has pointed out that the position is not quite as hopeless as it may seem – the pigment concentration in the leaf and that in the flower petal are in parallel proportion, and once we achieve a higher concentration of delphinidin in the leaf, this pigment will certainly appear in the petals also.

Arisumi also remarks that existing ‘blue’ roses are really lavender coloured. These colours are the result of a process technically called ‘co-pigmentation’ of the red cyaniding pigments and this is what has happened in all lilac or lavender roses, starting from ‘Grey Pearl’ (1943) and up to ‘Paradise’ (1979). If this feature of co-pigmentation could also be simultaneously introduced along with a high percentage of delphinidin, Arisumi predicts that the dream of a blue rose would definitely be realized. Readers may well ask ’Where does ‘Samba’ derive its delphinidin constituent from? Which is the specie responsible?’ Unfortunately the parentage of ‘Samba’ is not given. But a close scrutiny of the Arisumi papers shows that the same characteristic absorption spectrum, which led him to the conclusion that delphinidin was present, is there in the rose species, *R. roxburghii hirtula.* The genes of R. roxburghii appear in a host of modern varieties, such as ‘Floradora’ (Tantau, 1944), ‘Traumland’ (Tantau, 1958), ‘Montezuma’ (Swim, 1955), ‘Cinnabar’ (Tantau, 1945), ‘Queen Elizabeth’ (Lammerts, 1954) and many others. It is in this welter of rose varieties hopefully containing that most invaluable gene that the rose breeder must struggle if at all a blue rose, based on delphinidin, is to be realized, by traditional methods of cross pollination. And may such a breeder live long enough to attain his goal!

I am sure all rosarians and rose breeders would agree that the researches of Dr. Arisumi deserve their most earnest attention. I may have stretched my neck out by some of my speculations, but the main object in writing this article, apart from bringing to notice the monumental nature of the work done by that great Japanese scientist, would still have been achieved (even if my speculations prove correct), if others are sufficiently interested to try and ascertain the truth, and publicize it widely for the benefit of rose breeders.

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NEW APPROACHES TO ROSE BREEDING—THE ARISUMI PAPERS

—M. S. VIRARAGHAVAN, Kodaikanal

During the period 1964—1968, the eminent Japanese biochemist, Dr. Kanichi Arisumi, published a series of four papers entitled "Studies in the Flower Colours in Rosa" with special reference to biochemical and genetic analysis, and the application of these results to practical breeding. These papers which represent a masterly synthesis of the subtleties of biochemistry and their application to rose breeding have remained relatively unknown to rosarians, though their content and importance is such that they deserve to be a part of their essential knowledge. This article is an attempt to present from a layman's point of view the main features of these papers, their significance to practical rose-breeding and some further speculations on the theme.

Before dealing with the papers, it is necessary to briefly discuss the various pigments which are responsible for the colours of flowers. All red, orange and blue flowers generally derive their colour from water soluble pigments occurring in the aqueous cell sap, called ANTHOCYANIDINS. The three important anthocyanidins are :

1. PELARGONIDIN — present in orange red to scarlet flowers e.g. scarlet pelargonium (geranium), orange red dahlia or vermillion roses like SUPER STAR.
2. CYANIDIN — present in crimson to bluish red flowers, e.g. deep red dahlia, red roses such as PAPA MEILLAND.
3. DELPHINIDIN — present in violet to blue flowers, such as delphinium.

Apart from these three basic anthocyanidins there are certain other derivatives which are responsible for modified flower colour: in other words, various shades of red, vermillion, and blue. A number of other factors also influence the colour of anthocyanidins, e.g. iron salts intensify the colour; the pH of the cell sap, presence of tannins, organic acids and enzymes also play a part.

Other than anthocyanidins, there are a number of different pigments, such as FLAVONOLS (e.g. the colouring matter of the pale yellow Sea Rose, Mme. Falcot), and Carotenoid pigments (the colouring matter in carrots, or dark yellow roses), which are responsible for the white and yellow to brown range of flower colours. These pigments may be co-existent along with anthocyanidins with a consequent modification of the pure anthocyanidin colour range. It should also be noted that in many flowers the colour changes with the age of the bloom, e.g. the colour change from yellow to red of the rose variety CHARLESTON, and this is due to the modification of pigment composition during the ageing process.

In the light of the above, we may analyse the colours of roses as follows: Prior to 1900 there were only red (including pink), white and light yellow roses. The red and pink roses, e.g. the Hybrid Perpetuals, owed their colours to the presence of cyanidin; while the pale yellow colours, e.g. of the Tea Roses, were due to the presence of various types of flavonols. Initially the Hybrid Tea roses produced by crossing the Hybrid Perpetuals and the Teas had also the same colour range. But in the early years of the century, the famous French hybridizer, Pernet Ducher, succeeded in crossing the then existing rose varieties into the bright yellow rose species, R. Foetida (Persian Yellow); thereby the colour range of roses was greatly increased, because Pernet Ducher's cross brought in the genes for the production of the carotinoid type of pigment. All the bright yellow roses of today ultimately owe their colour to the original cross made by him.

A second major landmark in the development of rose colour was the introduction of the genes for the production of pelargonidin in roses. This occurred around 1930 and all today's vermillion or scarlet roses, e.g. SUPER STAR, owe their colour to pelargonidin.

As such we can see that the colour of modern roses is derived from CYANIDIN (red), and PELARGONIDIN (vermillion), as modified by the presence of various types of FLAVONOLS (pale yellow) and CAROTENOID pigments (dark yellow).

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The standard procedure adopted by Arisumi in his researches was to extract the pigments in various rose species, as well as in varieties belonging to different groups e.g. Teas, Hybrid Perpetuals, Gallica roses, etc. and to separate the pigments into different types adopting the method of paper chromatography. The pigments present were identified; thereafter deductions were made on the genetic composition of the various classes of roses in the light of pigment composition. Without going into too much detail the analysis carried out by Arisumi showed that the pigment in species roses was Cyanidin. But there were quite a few rose species containing other anthocyanidins such as PAEONIDIN and the modified cyanidin, CHRYSANTHAMIN. Most rose species also contained flavonols which were broadly divided into the KAEMPFEROL and QUERCETIN types. It is interesting to note that so many rose species contain paeonidin including the bicolour variant of R. Foetida, R. Pomifera, R. Californica, R. Nitida, R. Rugosa and R. Stellata variety Mirifica in which significantly it is the only anthocyanidin present.

The analysis of pigments in garden roses showed a remarkable difference in the anthocyanidin constitution in Hybrid Teas and Floribundas, even though both are derived from the common ancestor species, R. Chinensis. While the Floribundas had retained the original Chinensis i.e. tea rose genes more or less intact, the Hybrid Teas, though they are the result of crosses between Hybrid Perpetuals and Tea roses, had largely the genetic composition of the Hybrid Perpetuals — in other words, that of the tetraploid ancestral types such as Damask and Gallica roses, natives generally of the continent of Europe. As readers may have noted, one of the most interesting features of the Chinensis type of rose is the colour changing characteristics — originally of R. Chinensis mutabilis and of which there are numerous examples in the Floribunda class, starting from MASQUERADE and including CHARLESTON and many others.

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But generally, most rose literature till this day dismisses—incorrectly—the fact of delphinidin being present in the gamut of rose species and varieties, and talks only of other and far less obvious procedures for evolving a blue rose. Arisumi's painstaking analysis of the pigment composition of the young leaves of SAMBA showed beyond doubt that delphinidin was present, though in smalll quantities. (SAMBA leaves contain 15% delphinidin and 80% cyanidin the balance being other anthocyanidins). Arisumi has pointed out in his paper that the dream of the blue rose could be realized if, through selective hybridization, the delphinidin concentration could be so increased, that it appears in the petals also. From the chemistry point of view, pelargonidin, cyanidin, and delphinidin represent a series of anthocyanidine—pelargonidine having a single hydroxyl (OH) group, cyanidin two, and delphinidin three. Arisumi says that conditions are more favourable for hydroxylation in the leaves rather than on rose petals. As such it is easier to have pelargonidin in the rose petal, and delphinidin in the rose leaf. But he has pointed out that the position is not quite as hopeless as may seem—the pigment concentration in the leaf and that in the flower petal are in parallel proportion, and once we achieve a higher concentration of delphinidin in the leaf, this pigment will certainly appear in the petals also.

Arisumi also remarks that existing 'blue' roses are really lavender coloured. These colours are the result of a process technically called 'co-pigmentation' of the red cyanidin pigments and this is what has happened in all lilac or lavender roses, starting from GREY PEARL (1943) and upto PARADISE (1979). If this feature of co-pigmentation could also be simultaneously introduced along with a high percentage of delphinidin, Arisumi predicts that the dream of a blue rose would definitely be realized. Readers may well ask, Where does SAMBA derive its delphinidin constitutent from? Which is the specie responsible ? Unfortunately, the parentage of SAMBA is not given. But a close scrutiny of the Arisumi papers shows that the same characteristic absorption spectrum, which led him to the conclusion that delphinidin was present, is there in the rose species, R. Roxburghi Hirtula. The genes of R. Roxburghi appear in a host of modern varieties, such as FLORADORA (Tantau, 1944), TRAUMLAND (Tantau, 1958), MONTEZUMA (Swim, 1955), CINNABAR (Tantau, 1945), QUEEN ELIZABETH (Lammerts, 1954), and many others. It is in this welter of rose varieties hopefully containing that most invaluable gene that the rose breeder must struggle if at all a blue rose, based on delphinidin, is to be realized, by traditional methods of cross pollination. And may such a breeder live long enough to attain his goal !

I am sure all rosarians and rose breeders would agree that the researches of Dr. Arisumi deserve their most earnest attention. I may have stretched my neck out by some of my speculations, but the main object in writing this article, apart from bringing to notice the monumental nature of the work done by that great Japanese scientist, would still have been achieved (even if my speculations prove incorrect), if others are sufficiently interested to try and ascertain the truth, and publicize it widely for the benefit of rose breeders.

Indian Rose Annual - IRA 1984

WHITHER GOES THE ROSE?
VISTAS IN ROSE HYBRIDISATION

By M.S.Viraraghavan, Kodai Kanal

The rose is, and has been for centuries, the world's favourite flower. History, and symbolism, colour and fragrance and sheer elegance of form - whether classic beauty of the single bloom, or the complex perfection of the modern Hybrid–Tea – all combine to give the rose its pre-eminent position Even the prickles (thorns) have romantic associations

With all this, it would be a mistake to assume that the rose will always retain its pre-eminence, unless there is constant effort to improve and enhance the attractiveness of the rose by imaginative hybridization. The keyword is really imaginative – and that is where amateur rose hybridization will have to play a dominant role- much more so than it has done in the past. The warning signs – the limitations of commercial rose hybridization – are already evident. One has only to leaf through the new rose catalogues to realize that the flood of new H.T's floribundas , and other standard types pouring out from the big rose growers, are not really particular improvements on the standards attained in the past. These improvements will not contribute to the future of the rose. In fact they are only evidence of increasing, and, potentially disastrous economic pressures- to produce something new. The future of the rose is and will become increasingly more dependent on amateur rose hybridization, backed up by the support of rose societies throughout the world.

Dose not this last statement place an excessive emphasis on amateur rose breeding, you may well ask? The answer may not be very clear in India, where the popularity of the rose is still at the stage of spectacular growth. But the trend in other countries- even in the U.K. which has traditionally been the home of the rose- is not so encouraging. I quote from an article ‘Roses and Modern Times’ by Jack Harkness (American Rose Magazine, August 1982): ’When I began to breed rose in 1962, it was boom time for roses in Britain. The British nursery trade was budding around 50 million roses, one for every man, woman, and child in the country. The Royal National Rose Society was coasting along towards enrolling its 100,000th member. As proof of its confidence in the future, the R.N.R.S. took possession of its own country property near St. Albans, and began to cultivate it as a fine rose garden. Twenty years later, in 1982 the scene has changed. We are producing about half as many roses for sales and the Society has retained only a third of its membership. What went wrong?’

What went wrong was that rose breeding proceeded on too conventional lines, without taking into account the rapid changes taking place in public tastes, leisure time, economic pressures, and the like. Though there was a response to these changes on the part of the commercial breeder, this was hardly adequate, as the statistics given show.

In other words, rose breeding wasn’t imaginative enough. And this as I said earlier, is where the amateur breeder comes in, as no commercial breeder can really afford to concentrate mainly on even slightly long – range objectives – his emphasis will have to be on what is immediately saleable.

In fact, developments in other ornamental plants, perhaps not as popular as the rose, show clearly even now, that commercial plant breeding will have to give way, sooner or later, because of sheer economic pressures, to the efforts of amateurs supported by specialist societies, for example, in the delphinium (which is one of the most popular border plants in the U.K) the premier English firm of Blackmore & Langdon, which had contributed greatly to delphinium development, has already stopped delphinium breeding because costs make it no longer viable. But, the future of the delphinium is in safe hands says Mr. Stephen Langdon, of Blackmore & Langdon, as the challenge of the improvement has been taken up by score of amateurs with the backing of the Delphinium Society of U.K

You may therefore, expect in the future a greater emphasis on non-professional breeding work. While on this, we may note that the Presidents International Trophy awarded by the R.N.R.S (Royal National Rose Society, U.K) (The premier award) has gone in 1980, to REBECCA CLAIRE, an amateur raised rose, and in general, the amateur's performance has been noteworthy in the 80s.

With this broad perspective, we could consider the situation more specifically in India. In India there has never been large scale commercial rose breeding of the type in the west, though the first nurserymen did do rose breeding. I am referring to the pioneering work of Sri Bhatcharji of P.Bhacharji & Co. followed up in more recent times by Shri G. Kasturirangan of K.S.G. Sons, Bangalore. But the contribution of the amateurs, inspired by Dr. B.P. Pal as well as the efforts of the I.A.R.I. whose efforts, albeit professional, are hardly commercially motivated have been equally, if not more significant.

However, without belittling the work done, one has to admit that there has not been so far, a bold response to the challenge of breeding better roses for India. ***What we really need is a separate line of breeding for the warm tropical climate***, and more crosses between standard varieties evolved in the west, which have been selected for good performance in cold climates, will not lead us very far. We have to recognize that rose breeding in the West has been quite rightly motivated towards evolving winter hardy roses which grow vigorously and flower freely in the short summers of temperate climes. Typical results are roses like TROIKA (or ROYAL DANE., H.T POULSEN) or FREQUE (H.T.KORDES) very winter hardy, and which make enormous growth even in a short space of time. This same extra vigour results in unmanageable and ungainly plants in the forcing tropical weather where the cold tolerance of the variety is hardly relevant.

Or, to put it another way, roses for the tropics should be summer hardy and not winter hardy, and we have to consciously reverse a historical process of selection for tolerance to cold.

This apart, rose breeding at the non-professional level, should carefully avoid the well trodden paths of the Big Boys of rose breeding. There is everything to be gained by being original.

Within this framework, what are the vistas for rose hybridization in India, and, for amateur rose breeding in general?

1. BREEDING WITH ROSA CLINOPHYLLA

Taking the long-range aspect, first, the most obvious step is to start an intensive process of hybridization, involving *ROSA INVOLUCRATA* (Roxb. ex Lindl) - also called *Rosa clinophylla* Thory - probably the only rose species of the tropical tracts of India. Perhaps the only species of the tropics anywhere in the world. It is a curious fact that we in India have still not been able to take up rose breeding with this species though far away in the U.K. Mr. E. F Allen suggested that work with this species was an obvious course of action for breeding roses with better stamina to heat. (see article on Rose Breeding. Pg.125, R.N.R.S. Annual 1977). From the genetics angle, the main difficulty in taking up work with this species would be that it is a diploid, whereas standard roses are tetraploid. However this can be overcome by the standard procedure of back crossing the F1 generation which would be triploid on to the tetraploid garden rose - which should result in a certain proportion of tetraploid progeny.

But the most serious and practical, difficulty is that getting plants of this species. 18 years back, in 1965, I had obtained a few plants from the Botanical Survey. Of India, but they turned out to be R. multiflora which never flowered. More recent efforts through the National Bureau of Plant Genetic Resources, I.A.R.I have not produced any results. Perhaps the Indian Rose Federation should step in and arrange to have the rose species cultivated at an appropriate place so as to be available to rose hybridizers.

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As every rose grower in India knows, Rose Edward, the pink flowered very fragrant Bourbon Rose, and the Tea Roses do very well under Indian conditions. The Edward rose is grown on a field scale for making garlands even as far south as Tanjavur District of Tamilnadu, relishing the humid tropical climate. Tea roses are common everywhere in India - for e.g., the ubiquitous Mme. FALCOT with its distinctive yellowish green foliage and flowers of apricot blush, can be seen in every old house in Bangalore. The breeding potential of either R. Edward or Tea roses has never been adequately exploited for the simple reason that they are not obvious choices for rose breeding abroad, but in India, imaginatively handled, work with these should be very rewarding, provided one always keeps in mind their inherent mildew susceptibility.

3. BREEDING FOR DISEASE RESISTANCE

One of the chief reasons why beginners are put off growing roses is their susceptibility to mildew, black spot, and other fungus infections. Of these, black spot resistance is of greater importance throughout India, but fortunately there are some obvious approaches to breeding for black spot resistance. One of the species, *R. bracteata* is immune to black spot. *R. clinophylla* is closely related to this species and may well transmit black spot resistance. Seedlings of *R. bracteata*, like the famous climber, MERMAID were once thought to be sterile, and hence have not been used for breeding in the past. But, recently, the English hybridizer, Le Grice, has introduced a remarkably free flowering milk white floribunda, PEARL DRIFT, (NEW DAWN x MERMAID) which is available in India and which could be used for breeding work. Other sources of black spot resistance are the tetraploid *R. Multiflora* seedlings evolved in the U.S by Peter Semanouik, as well as the Harkness floribundas series staring with SOUTHAMPTON right up to the latest release, MOUNTBATTEN.

As regards mildew resistance I may mention the climber GOLDEN SHOWERS, many of the modern H.T's are also quite mildew resistant – for e.g. SILVER JUBLIEE, PRISTINE , etc.

4. NEW COLOURS

4.1 BLUE ROSE.

As dealt with in my article for the 1982 Indian Rose Annual, the researches of the Japanese biochemist Arisumi have shown that the pigment delphinidin, which could result in the blue rose is present in the leaves of the Floribunda SAMBA (Kordes, 1964) to the extent of 15 percent. Playing around with SAMBA should be quite interesting. That most original of thinkers on rose breeding, Wing Commander Young pointed out long ago that it was derivatives of the old multiflora CRIMSON RAMBLER, such as the polyantha GLORIA MUNDI that first accounted for the production of pelargonidin, from which are derived all the vermillion roses of today. Speculating further, Wing Commander Young notes that curiously enough, the bluest of the rose produced so far, such as the violet rambler, VEILCHEN BLUE, and the dwarf polyantha, BABY FARRAUX are also derived from Crimson Rambler. It is quite obvious that work with Veilchen Blue and Baby Farraux should produce very interesting results -- we have to again contend with the fact that they are both diploid.

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One of the England's eminent hybridizers Le Grice, has introduced a series of striking brown coloured roses, such as the floribundas AMBERLIGHT (Egyptian buff) Tom Brown (SATURN RED) and VESPER (Mars orange) here the brown colours were derived by the breakdown of the lilac rose pigment. As mentioned by Le Grice himself in his address to the 10th International Rose Conference (see article on breeding of blue and brown roses in 1968 R.N.R.S Annual). To summarize Le Grice further introduction of the genes of the species *R. CALIFORNICA* produced more stable brown colours. Here is a golden opportunity for the enterprising amateur breeder, as the basic work has been done, other sources of brown colour, could be the brownish orange floribunda MOHINI of I.A.R.I and the parchment brown H.T.JULIA recently introduced

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Starting with PICASSO, and up to the new release, MAESTRO, Sam McGredy has introduced a series of roses in combinations of pink, red, white which are referred to as the Handpainted strain, as the proportion of the three colours varies form flower to flower. Further possibilities in this strain are most intriguing, including red and yellow combinations, orange and yellow or mauve variations - these are obvious lines of work for the imagination hybridizer.

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The possibilities under these are innumerable - I will confine myself to two which strike me as most relevant.

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As Dr. Pal points out in his book, The Rose in India, rose gardening in the plains of India is at a disadvantage, as there are no suitable free flowering climbers. While the ramblers as a class are a complete failure in the plains, even the so called perpetual flowering climbers like GOLDEN SHOWERS do not flower freely. But, as has been suggested earlier, if someone were to start a programme of breeding based on the old Noisette Tea climbers like LAMARQUE or CELINE FORESTIER, both of which flower freely, remarkable results could be achieved.

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While miniature roses are increasing in popularity in India, the plants themselves are too delicate and the flowers too small to make much of a visual impact. Under the forcing warmth of the Indian plains, miniatures grow too tall and the small flowers are lost on the giant bushes. There is much potential for breeding work in the newly introduced miniflora series - roses where the flowers are somewhat larger than miniatures, but not as large as floribundas. Typical examples are the new Sunblaze series of roses form the French hybridizer, Meilland.

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Interesting results have been achieved in India by gamma ray irradiation. For example, the work done in the National Botanic Research Institute, Lucknow by Drs. M. N. Gupta and S.K. Datta. Mutation breeding by gamma ray irradiation is hardly suitable for the amateur rose hybridizer. But there are fascinating prospects in breeding work using irradiated pollen. One of the most obviously promising lines would be to use ultra violet radiation to irradiate pollen. Ultraviolet lamps are comparatively cheap and readily available.

To conclude, as is evident from this limited survey, the possibilities of rose breeding are indeed boundless, to the percipient breeder who must be a scientist and an artist - at least a bit of both. The future of the rose depends on such men.

Copies of the original
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With all this, it would be a mistake to assume that the rose will always retain its pre-eminence, unless there is constant effort to improve and enhance the attractiveness of the rose by imaginative hybridisation. The keyword is really 'imaginative' —and that is where amateur rose hybridisation will have to play a dominant role— much more so than it has done in the past. The warning signs— the limitations of commerical rose hybridisation — are already evident. One has only to leaf through the new rose catalogues to realize that the flood of new H.T.'s, Floribundas, and other standard types pouring out from the big rose growers, are not really particular 'improvements' on the standards attained in the past. These 'improvements' will not contribute to the future of the rose. In fact, they are only evidence of increasing, and, potentially disastrous economic pressures — to produce something 'new' every year, so as to continue in the race. On the other hand, the future of the rose is, and, will become increasingly more dependent on amateur rose hybridisation, backed up by the support of rose societies throughout the world.

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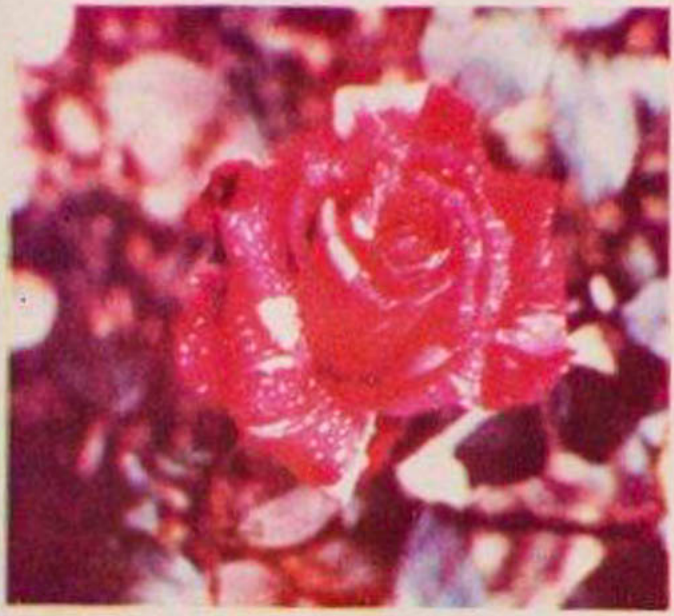
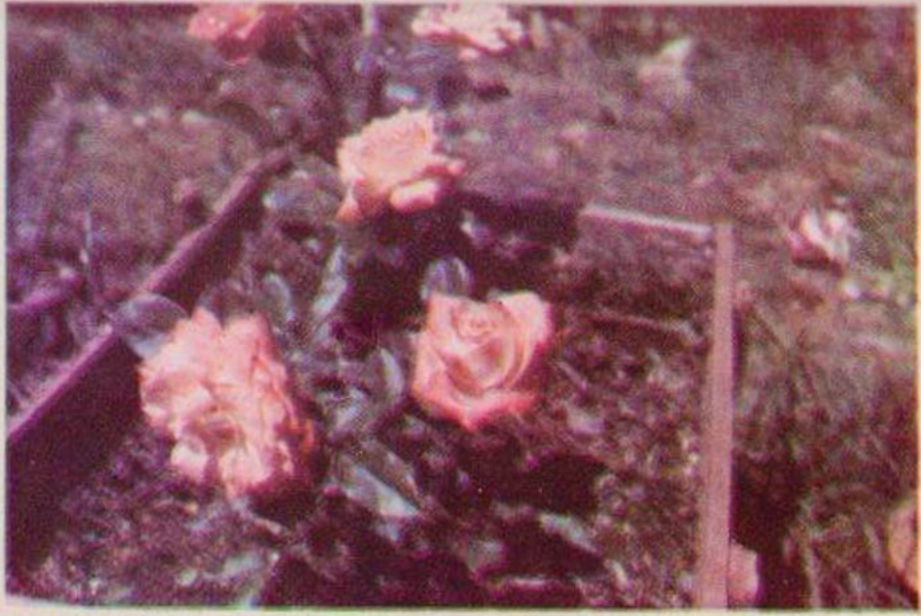
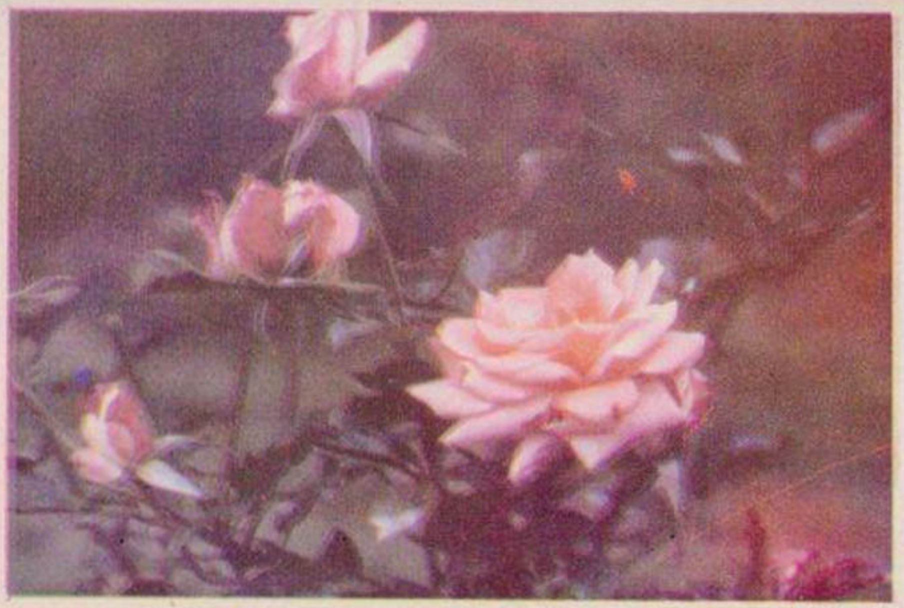


CHITRALEKHA (M. S. Viraraghavan Kodaikanal 1982) The rose bears flowers in a rich shade of wine red striped pale pink. A Most distinctive rose with large flowers of perfect exhibition form, held for a long time. This beautiful photograph is by Shri W.P. A.R. Rajaram.



KADAMBARI (M.S.Viraraghavan Kodai kanal,1976). Floribunda, Little Darling X (Grussen Teplitz X (Honey Favourite X Unknown)). A good Floribunda with unusually coloured flowers of pastel orange shaded lac red with centre and reverse Ivory.The colour which gradually darknes remains bright to the end.



SEEDLING (M.S.Viraraghavan,Kodai kanal 1983). H.T.Rose.One from Viraraghavan's hand-painted series to be released.

Indian Rose Annual - IRA 1985

ARISTOCRATS OF THE ROSE WORLD

India's Wild Roses And A Few Others

M. S. Viraraghavan

"...... a musk rose blowing,
In a green island far from all mens knowing."
(Keats)

You would not wonder why wild roses should be considered the aristocrats of the rose world if you had seen their windswept beauty in their remote mountain homes, or stood enraptured before them, dazzled and may be slightly bewildered by the combination of elegance, profusion and fragrance. I, for one, still remember turning a corner on the footpath to the Valley of Flowers in the Himalayas, when suddenly, there was a glint of ruby in the shimmering ice cold waters of the Pushpganga - there, on the opposite bank, and by the side of the wooden bridge across, was a 10 foot bush of *Rosa macrophylla* covered with warm pink, almost claret red flowers set off by golden anthers and a most alluring fragrance - an aristocrat indeed.

In India, though we have many wild roses, we are somewhat unlucky that the majority can be grown only in the mountain areas. But much more can be achieved in the plains than is commonly realized, if a little extra care is taken. Unfortunately, Indian rose lovers seem to have forgotten the classic five petaled beauty of the single rose. To my mortification, I have heard so many otherwise knowledgeable rosarians point out to the single roses in my collection - I have quite a number - and tell me that ‘that does not look like a rose.' Complicated explanations ensue, but the visitor leaves unconvinced with the argument that the true and original form of the rose is the single five petals of the species, and not the complex doubles created by man.

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In many ways the most amazing of all rose species is the aptly named *Rosa gigantea*. I can do no better than to quote the well known authority, Graham Thomas. "*Rosa gigantea*, the giant rose - you might say, the Queen, the Empress of wild roses, ascends in nature to a height of 40 feet or more by means of its strong shoots and hooked prickles with large elegant drooping leaves and great lemon white silky flowers 5" across”. In India, this rose is found in Sikkim, in the North East - in Meghalaya and Manipur and in the contiguous areas of Burma and South West China. Not only are the flowers giant, but the hips of this rose are equally large. Nancy Steen in her book, " The Charm of Old Roses ", refers to the fruits being sold in the bazaars of Manipur as the Nagas are fond of their sharp taste !
Rosa gigantea has made a very significant contribution to the parentage of modern roses, as it is one of the parents of the Tea roses which are, as you know, the progenitors of today's Hybrid Teas. It would seem that the pale yellow and orange colours of the Tea roses as well as the long elegant petals of some of them owe their colour and form to the influence of *Rosa gigantea*. Technically speaking, *Rosa gigantea* has provided the base for the flavonoid yellow colours in the rose world - the only yellows in roses till Pernet Ducher made the historic cross with *Rosa foetida*, the Persian Yellow rose towards the end of the last century. *Rosa gigantea* has also been used by the late Sir Alistair Clark of Melbourne to raise a

series of climbers e. g. Nancy Hayward, Lorraine Lee etc., which are admirably adapted to the Australian climate. Similar work was done by the French Breeder, Nabonnand. Indian hybridizers should repeat these crosses and may be, with a little bit of luck, we could have the long awaited climbers suitable for the plains of India.

2. INDIA'S MUSK ROSES: *ROSA BRUNONII, ROSA LONGICUSPIS & ROSA LESCHENAULTIANA.*

I now take up the wild roses which are found in India which can be broadly classed as part of the musk rose complex. We have 3 of them - all climbers. One of the most prominent is the Himalayan *R. Brunonii* (*R. moschata brunonii*) which has in ample measure that most endearing characteristic of the musk rose - the capacity to waft fragrance in the air. Many beautiful bushes of this rose could be seen on the footpath to the Valley of Flowers, covered with white blooms and emitting a most delicious fragrance. One of the most famous clones of this rose is *R. brunonii* La Mortola, named after the well known garden of that name in Italy.

Another North Indian member of the musk rose group is *R. Longicuspis* which again has white flowers in clusters and is found in the Khasia and Mishmi Hills.

The third Indian representative is *R. Leschenaultiana* (*R. Moschata leschenaultiana)* which is the musk rose of the Nilgiri and Palni Hills. This rose, which is fairly common near Kodaikanal, (where I live) has striking plum coloured stems and bears clusters of scented creamy white blossoms. The golden anthers set off the beauty of the rose. *R. leschenaultiana* is probably one of the most obscure members of this group - so obscure that the rose hybridiser's bible, Modern Roses 8, refers to it as not known to be cultivated. I am the proud possessor of a giant bush, clambering over my greenhouse and providing welcome shade to the tender plants within. Sadly, efforts at hybridisation with this rose have not made much headway so far.

Other musk roses have played a part in the evolution of the modern rose. Members of this group are the ancestors of the Noisette roses, for e. g. the golden Marechal Neil, which is still popular in India. More obscurely these roses are connected to the Pemberton Hybrid Musks like Prosperity, Vanity etc. and even more remotely to the modern Hybrid Musk shrubs of the type of Hamburg, Bonn, Elmshorn and the like, raised by Kordes.

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Perhaps the most interesting of India's roses, from the Indian rose hybridiser's point of view, is the white flowered *R. clinophylla* which has the uncommon distinction of being a wild rose found in the tropical tracts of India, especially in the plains of Bengal - maybe it is the only wild rose of the tropical tracts anywhere in the world. There are exciting possibilities of hybridisation with this rose, which I have referred to earlier in detail in my article " Vistas in Rose Hybridisation", in the 1983 Indian Rose Annual. So without repeating myself, here is a golden opportunity for the enterprising hybridiser to produce for the first time roses suited to the tropical heat. Sri Narender Singh of the Ranchi Rose Society informed me that he had seen this rose growing in abundance on the banks of streams in Ranchi areas almost to the water's edge.

Another interesting point is that this species is closely related to the black spot resistant *R. bracteata*, with which I deal later.

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Here we have one of the most spectacular of India's roses in eye catching shades of warm rose pink, found in the mountainous areas of the country, from Kashmir eastwards to Sikkim, as also in Pakistan and China - at altitudes of 2100 m - 3800 m. Interestingly there are both diploid and tetraploid versions of this rose. The tetraploid could well be used by Indian breeders. Readers would be interested to know that *R. macrophylla* was used by the famous botanist G. G. Hurst in one of his interspecific crosses which led to the hybrid sub-species *R x coryana* (R*. macrophylla x R. roxburghii*). McGredy describes this diploid hybrid as a tall sparingly prickly shrub with single rich pink flowers 2" in diameter. McGredy himself has used it to produce the floribunda Maxi, very disease resistant, which again is in the background of his Hand painted roses, Old Master and Regensburg. The well known American breeder Boerner also seems to have used this species to evolve the floribunda shrub Mandarin, which has blooms of a warm rose pink.

Apart from the flowers one feature of *R. macrophylla* is its very large hips - the largest bottle shaped hips of any rose according to the rose authority, Bertram Park.

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This is one more Indian species bearing flowers in shades of pink - in this case with a hint of lilac. It is the wild rose of the Western Himalayas, favouring the comparatively drier regions at altitudes of 1500m - 4100m. In its typical forms it is a shrub with slender branches and straight prickles but apparently some forms of this are very near some of the variants of *R. macrophylla* referred to earlier.

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R. ecae is another bright yellow rose species of Western Asia which has become naturalized in India. It is even used in hedges around Kargil in Ladakh. A beautiful hybrid, Golden Chersonese (*R. ecae* x Canary Bird) by E. F. Allen of England has been raised from this species but it does not seem to be available in India.

9. *ROSA LAEVIGATA* :

One of the most beautiful of wild roses is *R. laevigata* also known as the Cherokee Rose, or Mardan White. This rose is originally from China but has been naturalized in U. S. A. Indeed it is the State flower of Georgia. In India also *R. laevigata* is grown in a number of places - for, e. g. Delhi and Kodaikanal, and is naturalized extensively in the Khatmandu Valley, Nepal. The reason for this wide distribution is not far to seek. *R. laevigata* produces large white single flowers with beautiful golden anthers. The petal texture is extraordinarily good and the flower retains its beauty for a few days. But in a way even more beautiful than the flowers are the striking leaves - shining bright green, dense, with three leaflets and nearly double the size of a normal rose leaf. The leaves alone would place this plant a class ahead of other roses. Unfortunately this very attractive rose has proved quite difficult to hybridise. One of the few hybrids available in India is Mardan Pink (also known as Sinica Anemone and Pink Cherokee) which bears single pink flowers in profusion once a year. A charming white flowered hybrid raised in the U. S. by Dr. Walter Van Fleet is the aptly named Silver Moon - reputedly one of the most vigorous of climbers, easily reaching 40 feet. But this does not seem to be available in India. Altogether one of the most aristocratic of roses, I feel a determined effort should be made to breed with *R. laevigata*, as the foliage characteristics would revolutionize roses. If it was possible to create a Hybrid Tea with this kind of foliage, it would take the world by storm - at least the sub-tropical areas, *as R. laevigata* is somewhat frost tender.

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This species, commonly referred to as the Banksian rose, is available in two colours - white and yellow. Both forms are vigorous climbers with long thornless stems and flowers borne on slender stalks - one of the few roses which arc absolutely thornless. The Banksian roses are grown in a number of places in India, especially in hillstations e.g. Simla, Ooty and Kodaikanal but (especially the white version) can easily be grown in the cooler sections of the plains too. The long drooping stems render the white Banksian an ideal subject for weeping standards - such standard roses can be seen in large numbers in North India, e. g. Sunder Nursery, New Delhi. The Guinness Book of Records refers to an unique hundred year old specimen of the white Banksian rose in Arizona, U.S.A. covering an area of 5380 sq. ft., and producing hundreds of thousands of blooms in spring.

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Hybridising work with these roses has not been very successful - though the Italian breeder, Mansuino has produced a white flowered climber, Purezza.

11. *ROSA BRACTEATA* :

R. bracteata, which is a native of Burma and China, is closely related to *R. clinophylla* referred to earlier. Graham Thomas, quoting the famous plant explorer, Kingdon Ward ("Plant Hunting On the Edge of the World"): "Forty miles from Myitkyina in Burma" - (within 200 miles of the Indian border near Manipur) - " the botanist gets his first thrill. Here, the long ribs of slate rock, which in March, are exposed in the riverbed are covered with wild roses (*R. bracteata*) and crimson azalea (*Rhododendron indicum*)". Readers may note the close similarity to *R. clinophylla*, in that both roses are lovers of moisture and found on the banks of streams. *R. bracteata* is one of the most striking of wild roses bearing flowers about 3" across, pure white, with an eye-catching silky appearance, further adorned by orange yellow stamens. The name ‘Bracteata’ refers to the leafy bracts surrounding the flowers.

Here again the leaves are very beautiful, being glossy - of darkest green, and with the most unusual characteristic of being blunt at the apex. Unlike many other species roses this is virtually perpetual flowering, and to cap it all, the species has a marked resistance to black spot. In spite of so many enviable qualities very few hybrids have been raised from *R. bracteata*, One of the most splendid is that breathtaking climber, Mermaid which is a cross with a yellow tea rose. This, one of the most beautiful of all climbers, bears huge, single creamy yellow flowers with the same beautiful stamens of the species. Unfortunately Mermaid is better suited to the climate of

Indian hill-stations. But *R. bracteata* can probably easily be grown in places with a climate similar to Delhi. For a long time Mermaid was considered to be sterile. But the English breeder Le Grice, in a remarkable cross between Mermaid and the climbing rose, New Dawn, has recently introduced a floribunda shrub, Pearl Drift. This produces bunches of flowers of a lovely milk white stained pink, and being available in India, is worth the attention of rose lovers, if only for its unique parentage.

12. *ROSA BEGGERIANA* :

To conclude this article I will deal briefly with *R. beggeriana* which again is a wild rose of Western Asia, but quite common in the Kashmir Valley. This white flowered semi-climbing shrub, is perhaps not the most striking of wild roses, but it has a very important plus point - the hips contain an unbelievably high concentration of Vitamin G. Research in Poland has shown that these hips contain as much as 5020 mg % of Vitamin C (i. e. 5020 mg in 100 gms of hip). An interesting series of hybrids with *R. rugosa* have been evolved, also in Poland, so as to combine the large hips of *R. rugosa* and the high vitamin C content of R. *beggariana*, with considerable success.

Now the galaxy is complete - Indian wild roses are certainly among the most aristocratic of Roses. While some can be grown in the climate of the plains, no rose lover should miss the opportunity of seeing them in their native habitat – the ‘green islands' of the Himalayas - truly an unforgettable experience.

Copies of the original
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*Hill View, Fern Hill Road, Kodaikanal-624 101, Tamilnadu.

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Hybridising work with these roses has not been very successful—though the Italian breeder, Mansuino has produced a white flowered climber, Purezza.

11. ROSA BRACTEATA :

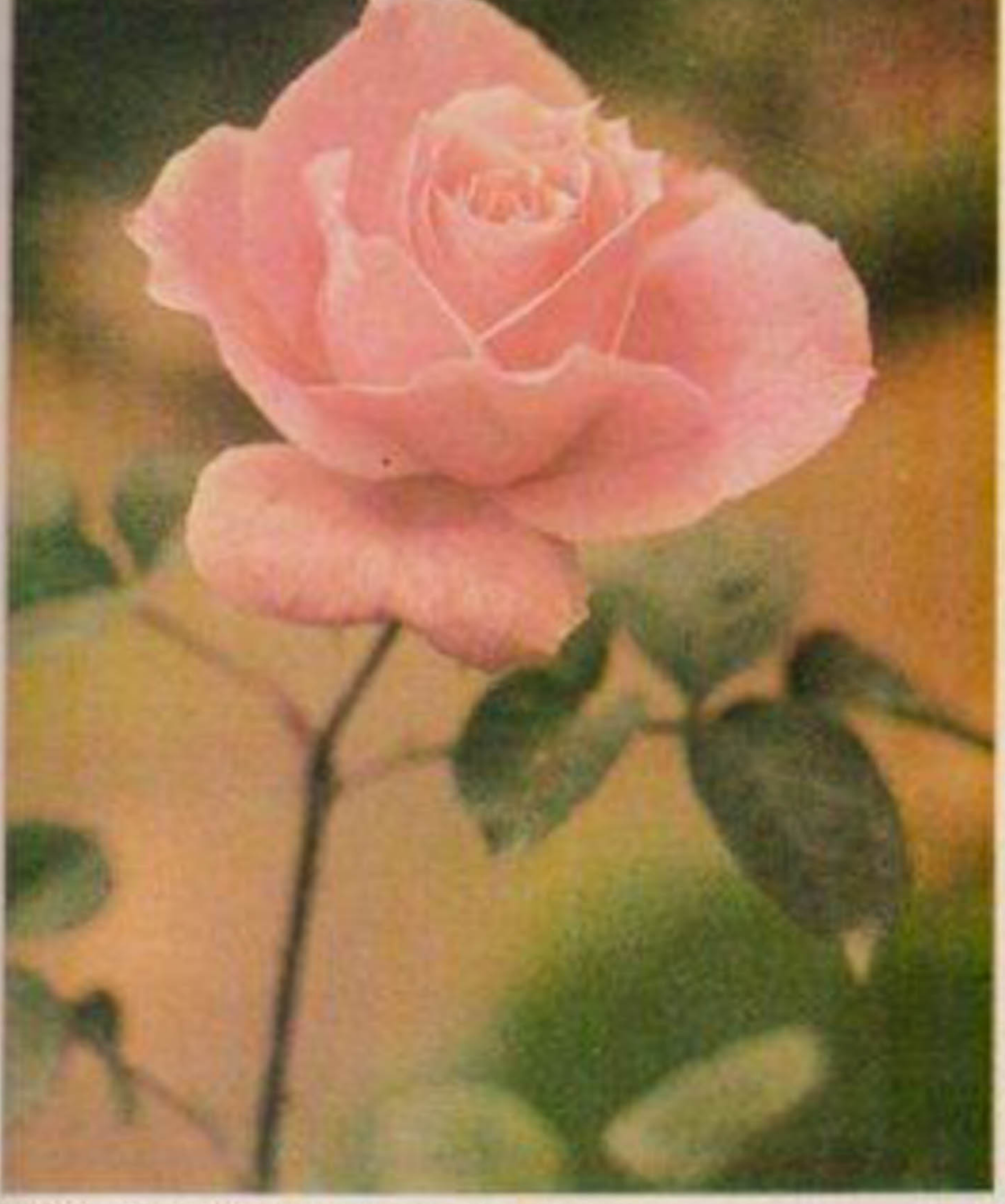
R. Bracteata, which is a native of Burma and China, is closely related to R. Clinophylla referred to earlier. Graham Thomas, quoting the famour plant explorer, Kingdon Ward (" Plant Hunting On the Edge of the World ") : " Forty miles from Myitkyina in Burma "— (within 200 miles of the Indian border near Manipur)— " the botanist gets his first thrill. Here, the long ribs of slate rock, which in March, are exposed in the riverbed are covered with wild roses (R. Bracteata) and crimson azalea (Rhododendron Indicum) ". Readers may note the close similarity to R. Clinophylla, in that both roses are lovers of moisture and found on the banks of streams. R. Bracteata is one of the most striking of wild roses bearing flowers about 3" across, pure white, with an eye-catching silky appearance, further adorned by orange yellow stamens. The name Bracteata refers to the leafy bracts surrounding the flowers.

Here again the leaves are very beautiful, being glossy—of darkest green, and with the most unusual charcteristic of being blunt at the apex. Unlike many other species roses this is virtually perpetual flowering, and to cap it all, the species has a marked resistance to black spot. In spite of so many enviable qualities very few hybrids have been raised from R. Bracteata. One of the most splended is that breathtaking climber, Mermaid which is a cross with a yellow tea rose. This, one of the most beautiful of all climbers, bears huge, single creamy yellow flowers with the same beautiful stamens of the species. Unfortunately Mermaid is better suited to the climate of Indian hill-stations. But R. Bracteata can probably easily be grown in places with a climate similar to Delhi. For a long time Mermaid was considered to be sterile. But the English breeder Le Grice, in a remarkable cross between Mermaid and the climbing rose, New Dawn, has recently introduced a floribunda shrub, Pearl Drift. This produces bunches of flowers of a lovely milk white stained pink, and being available in India, is worth the attention of rose lovers, if only for its unique parentage.

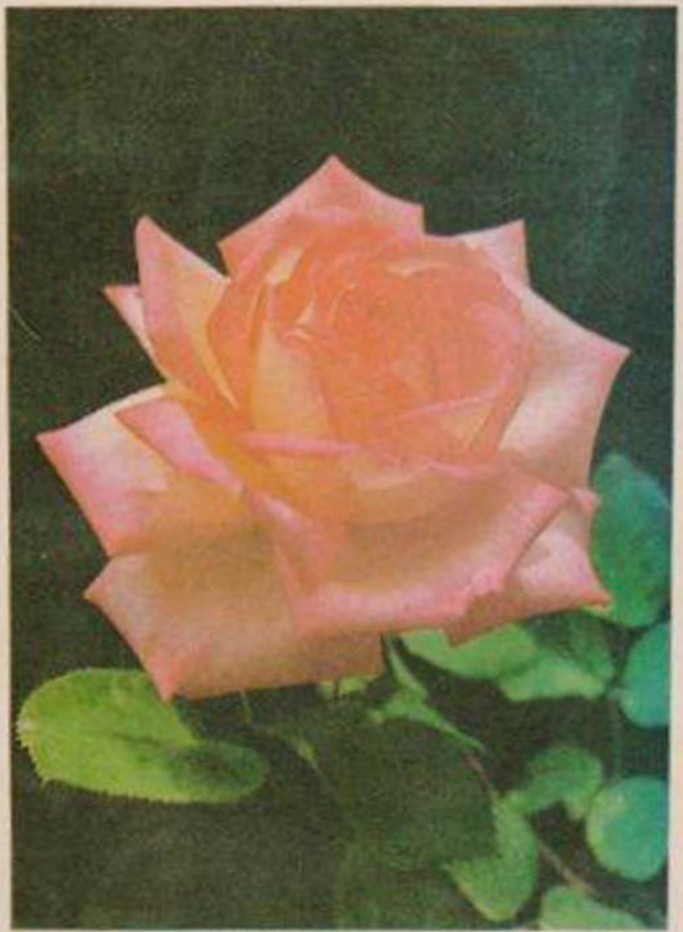
12. ROSA BEGGARIANA :

To conclude this article I will deal briefly with R. Beggeriana which again is a wild rose of Western Asia, but quite common in the Kashmir Valley. This white flowered semi-climbing shrub, is perhaps not the most striking of wild roses, but it has a very important plus point—the hips contain an unbelievably high concentration of Vitamin C. Research in Poland has shown that these hips contain as much as 5020 mg.% of Vitamin C (i. e. 5020 mg. in 100 gms. of hip). An interesting series of hybrids with R. Rugosa have been evolved, also in Poland, so as to combine the large hips of R. Rugosa and the high vitamin C content of R. Beggariana, with considerable success.

Now the galaxy is complete—Indian wild roses are certainly among the most aristocratic of Roses. While some can be grown in the climate of the plains, no rose lover should miss the opportunity of seeing them in their native habitat—the 'green islands' of the Himalayas— truly an unforgettable experience.



RAJNI : (M. S. Viraraghavan, 1983. Introduced by Anand Roses) Hybrid Tea. (Violaine x Margaret Merrill). Giant, impeccably fashioned very fragrant blooms of pink with distinct lilac shadings.



Unnamed H. T. seedling (M. S. Viraraghavan) (Royal Dane x Priyatama) In the handpainted strain; very large beautifully shaped flowers showing the much desired combination of yellow with orange markings.

Photo : R. Haresh

Indian Rose Annual - IRA 1986

First steps in Rose Hybridization with *Rosa Clinophylla*

(*ROSA INVOLUCRATA*)

M.S. Viraraghavan

For sometime now, the prospect of breeding an entirely new strain of rose with the genes of *Rosa clinophylla (R. involucrata*) has fascinated hybridisers in India. This is for the simple reason that this species, native to the plains of Bengal and adjacent areas, is probably the only rose species in the entire world that is found in the tropical regions, and as such, hopefully carries the genes for heat resistance. Prima facie, this species should also have resistance to water logging as it is normally found near streams and marshy places. In fact, the clone which is now with me was collected by Mr. Narender Singh of Ranchi from the dense clumps of the rose, growing wild with their roots partially in the stream bed of a stream in a forest near Ranchi (Chota Nagpur Plateau, Bihar, now Jharkhand State).

According to the classification in the 'Chromosome Atlas' of flowering Plants by C.D. Darlington and A.P.Wylie, *Rosa clinophylla* is part of sub-genus Bracteatea within the sub-genus being confined to two species, *Rosa clinophylla* and *Rose bracteata*. The latter, also referred to as the Macartney Rose, is native of Southern China and Northern Burma, and is found in similar very moist situations by the sides of streams etc..

From the material sent by Mr. Narender Singh, attempts to propagate *R. clinophylla* were made in two ways, one by cutting and the other by budding on to stocks of *Rosa multiflora*. Propagation by cuttings was not successful but budding on to *R. multiflora* produced approximately 40% take. The budded plants grew away quite rapidly and now, after two years, are well over 6’ tall, with an upright moderately branching habit.

The plant has a close resemblance to the bramble (raspberry) as was long ago observed by Firminger in his complete Gardening in India. A distinctive feature is the brown mottled bark, curiously similar to the mottling found on some types of snakes. Flowering on the budded plants started in spring (April in Kodaikanal) of the second year after they were planted down in the ground. The flowers are single, with five petals, white, with fairly thin substance. The most attractive feature is the bright golden yellow stamens, which, when dehiscing, have a characteristic fragrance of acetone (like nail polish remover) – which characteristic it shares with *Rosa bracteata*.

In general, this rose in Kodaikanal closely conforms to the description in Dr.B.P.Pal’s book, “The Rose In India” - 'A stout, erect or semi-climbing shrub, flowers white, borne singly or in clusters, fruits roundish, hairy and pale.’ The flowering continues for a long period, with peak flowering in April and May, and scattered flowers thereafter. It may be said to be almost continuous flowering although not, unfortunately, to the same extent as *R. bracteata*. Also, this species is quite susceptible to both mildew and black spot, whereas *R. bracteata* is not affected to the slightest degree by either of these two diseases.

The foliage is light green, deeply veined with 5-7 leaflets, with the apex leaflet considerably elongated, oblong to oblong / lanceolate in shape. The foliage is shining above and glabrous beneath. The curious involucres (i.e groups of bracts enveloping the young inflorescences) are another feature by which this species can easily be recognized. Again there is a close resemblance here to *R. bracteata*. Under Kodaikanal conditions the hips take a very long time to mature-nearly six months, as against the normal four months for the Hybrid Teas. Each hip contains from 5-10 fairly small seed.

Rosa clinophylla is a diploid with 14 chromosomes, unlike modern roses which are tetraploid (28 chromosomes). Any programme of breeding with this species has, therefore, to take into account the difference in chromosome number. Fortunately, the Tea roses which are quite fertile, under Kodaikanal conditions, are also diploid and are the obvious choice for breeding work with this species. Experience shows that when working with specie roses, it is easier to use the species as the male or pollen parent and this principle was followed during the first year, 1985, when two series of crosses were attempted with *R. clinophylla* as the male parent. The first group of crosses was with the pink tea rose, Mrs. B. R. Cant (?) which bears abundant self hips under Kodaikanal conditions, with a pale cream Tea rose, Mme Hoste (?), and the climbing white tea Noisette, Lamarque. The second series of crosses with *R. clinophylla* as the male parent was done using some very fertile standard tetraploid roses including Little Darling (Fl), Queen Elizabeth, Independence and Lover's Meeting.

The results, as could probably have been anticipated, were quite disappointing with no seeds at all from the large number of crosses with Lamarque, and with Mrs.Hoste. A few were sown in September 1985 but they have not sprouted to date - October 1986. Of the crosses with the tetraploids, the cross with Little Darling produced fairly good seed set, there was also some seed set with the crosses with Queen Elizabeth and Independence; through Lover's Meeting was a complete failure. Seeds from these crosses, sown in October 1985, have not yet sprouted and the prospect of sprouting now seems remote.

Attempts were also made to use *R. clinophylla* as the seed parent with pollen from *R. bracteata*, on the logic that the two are closely related and so the cross should be easy. Out of a large number of crosses there was a fair percentage of success and to date, six seedlings have sprouted but not yet flowered. Looking at the seedlings, it would appear that at least two or three may be genuine crosses as the foliage looks nearer to *R. bracteata* than to *R clinophylla*, but we can reach firm conclusions only after the first flowering, which hopefully should be in the spring of 1987.

During 1986, with the *R. clinophylla* plants having grown much bigger and stronger, the same breeding strategy more or less was adopted. With *R. clinophylla* as pollen parent a large number of crosses were made with several Tea roses, including Mme. Hoste (?), Mrs B. R. Cant (three different clones with probably one at least being a different variety altogether), with a buff coloured tea, Safrano (?) and with two climbing Tea roses, one a cream with pink edges Gloire de Dijon (?) and the other light lemon yellow - Celine Forestier; as also with the diploid polyantha Tea, Celine Brunner. For the second year running, Mme Hoste refused to oblige and of the three variants of Mrs. B. R.Cant, good seed was set by only one – a very large number of crosses with Cecile Brunner successful. A few seeds came with the cross with Gloire de Dijon (?) but none from Celine Forestier.

With tetraploid seed parents the crosses were repeated using Little Darling with some success, and a fair number of seeds have been harvested to date. Naturally results will have to wait for sowing time which will be only later in the year.

Reverse crosses using *R clinophylla* as the seed parent and *R. bracteata* as the pollen parent were repeated. There has been appreciable take but the hips are yet to be harvested (October 1986).

As would be evident from what has been described above, breeding work with *R. clinophylla* is not going to be easy. It is quite disappointing that the Tea roses should be so reluctant to set seed with *R. clinophylla.* A success with this strategy would have made progress much easier. But perhaps one of the few seeds from the 1986 Tea crosses will sprout? With a bit of luck maybe a few seeds with Little Darling as the seed parent should also germinate. While I do not intend to give up perhaps the work requir,es a younger rose breeder (in his ‘20s) or a research institution.

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The Indian Rose Federation

First Steps in Rose Hybridization with Rosa Clinophylla

(ROSA INVOLUCRATA)

M. S. Viraraghavan*

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* Hillview, Fernhill Road, Kodaikanal 624101 Tamil Nadu

Multiflora. Propagation by cuttings was not succesful but budding on to R. Multiflora produced approximately 40% take. The budded plants grew away quite rapidly and now, after two years, are well over 6' tall, with an upright moderately branching habit.

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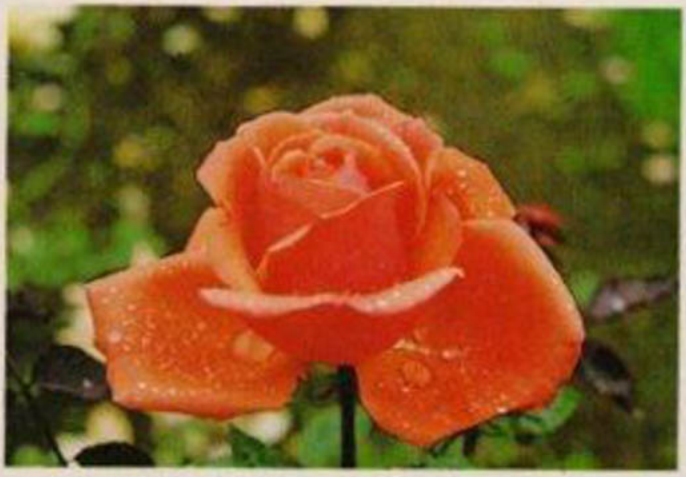
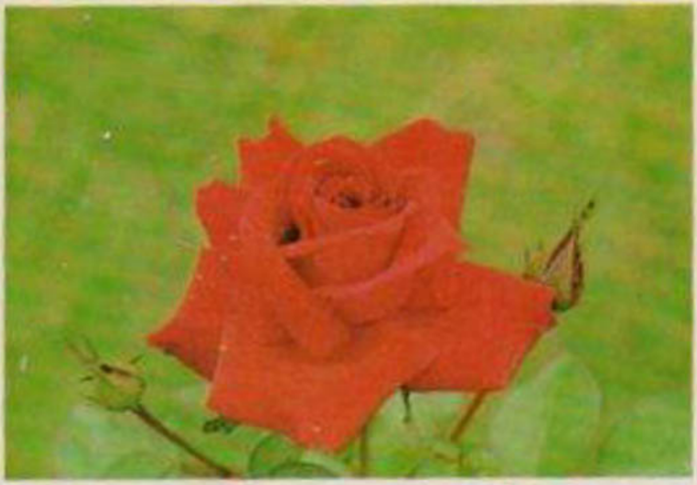


Lover's Meeting & Priyatama : H. T. (M. S. Viraraghavan, 1985)
A fluorescent orange variety; still under trial.



Independance & Kanchi : Fl. (M. S. Viraraghavan, 1985). An attractive H. T. type floribunda with beautifully shaped clear red blooms. To be released by K. S. G. Sons in 1987.

Cover Illustrations :

ROSE ABHAYA '87 (H. T.), M. S. VIRARAGHAVAN

A VARIETY IN THE HAND PAINTED STRAIN

PRINTED AT KIRLOSKAR PRESS, PUNE [illegible]

Indian Rose Annual - IRA 1987

THE EYE OF THE BEHOLDER

M.S. Viraraghavan

The saying ‘Beauty lies in the eye of the beholder’ has been repeated so often that it has become trite and commonplace. But what is not so obvious is why different eyes see so differently. This, however, becomes clear when we understand that perception is conditioned by numerous factors – sociological, cultural, historical and last of all, the climate in which the observation is made. But this is not an article on what the eye sees in general but one on perception of one aspect of the rose – its colour.

What we see as beautiful or desirable is definitely closely linked with sociological factors. An extreme example is the depiction of the Almighty as black and the Devil as white by certain Central African tribes, in startling contrast to the traditional view. An example nearer home are the various theories to the effect, that the god Krishna, who is depicted as blue-black, is the god of the Dravidians. I do not wish to enter into this controversy, which has racial overtones, but merely mention it as an example of how different the perception of what is desirable can be, depending on the background of the person concerned.

Such extreme examples apart, there is a surprising degree of difference in the acceptability of various types of colours to different persons. A typical instance is the colour magenta, - including within it shades of colour from reddish-purple to lavender. We in India, and especially in South India, love the rich reddish-purple colours; but to an Englishman they are anathema. No magenta coloured rose has any hope of acceptance by the cognoscenti in the U.K., and even otherwise perfectly beautiful fragrant roses, like say Wendy Cussons, never quite made the grade on account of their magenta overtones. There is a simple historical or, perhaps, cultural factor involved, viz., that magenta was the colour of one of the first synthetic dyes evolved in the early years of the industrial revolution. So, cheap cloth in those days was coloured magenta, and looked at with disfavour by the prosperous. We see the hangover of this to this day.

Again, the climate has a profound impact in acceptability of colour. In a cool, damp climate, what an Indian rosarian may consider a beautiful pure lilac, comes out too often as a muddy grey. Even within our country, the contrast between the appearance of a rose like Blue Moon in the warm, dry climate of Hyderabad and a cool damp climate of Kodaikanal has to be seen to be believed. Likewise, the beautiful Papa Meilland, with is exquisite shades of red under-laid darker – one of the favourite roses of the Indian plains – is much less attractive when the weather turns cold and damp – when the black underlay changes to an unacceptable shade of purple.

Without going into further detail on the variations of the perception of colour, it is important to refer to one very important factor, which is closely related to pigment composition and their ability to transmit or reflect light. The pigments of the rose have already been dealt with in several earlier articles in our rose annuals. But the important fact to be noted is the differences in luminosity arising from whether the coloration of a flower is due to a water soluble pigment or one which is insoluble in water. In roses, as is well known, the anthocyanin pigments- cyanindin and pelargonidin, contribute the red and vermillion colours. Yellow to orange shades are derived from water soluble flavanols, the yellow colour of the old tea roses like Marechal Neil is entirely due to flavanol. Another source of yellow colour- the source of the dark yellow to apricot tones are however the water insoluble carotenoid, and anthocyanin is responsible for the startlingly brilliant colours of modern roses.

But the point I would like to emphasize is that an excess of concentration of carotenoid very often leads, quoting Dr. David Leach, a well know authority not on roses, but on rhododendrons, 'to an opaque flower appearance without lustre or gloss'. In an interesting observation on what should be the ideal yellow rhododendron, which applies just as well to the ideal yellow rose, as rhododendron yellow colours are derived just as in roses from flavanol yellow, and carotenoid yellow, Dr. David Leach says ,'ideally, reinforcement by carotenoids to the extent that luminosity is not lost would yield a combination of transmitted yellow light via the flavanols and reflected yellow light from the carotenoids: there would be a trade-off of some brightness and vibrancy for greater colour saturation.' (Journal of the American Rhododendron Society, Winter 1982). Carrying the argument further, we may observe that the glow which we associate with some of the most beautiful roses is because of the petal texture allowing transmission of light to some extant. This is very evident in some of the colours of the roses in the 'Hand-painted' strain.

In this background of extreme complexity in the perception of colour, it is quite amazing that we hear the observation, when someone is buying a rose plant, that he will not have, say for example, another red rose merely because he has a red already in his collection. Such insensitivity stems from what can only politely be called ignorance-the doors of perception have not yet been opened.

In contrast to this attitude is the vivid description of colours by the well known authority, Michael Haworth-Booth ('Effective Flowering Shrubs'), based on the colour charts of the Royal Horticultural Society, U.K. Dealing with the blues, Haworth-Booth remarks that only bees like the magenta colours- reddish purples or purplish pinks, ranging from Solferino purple and going bluer all the way through magenta itself- fuschia pink, fuschia purple, rhodamine purple, peony purple. Mallow purple to cyclamen purple; next, and still going bluer all the time, we reach orchid purple and petunia purple, then onto mauve and imperial purple which are followed by the violets. This range of colours can be visualized if we think of the colours of roses starting from Swarthmore, Kanchi, Manou Meilland, Purple Beauty, Violaine, News and the latestIinternational Herald Tribune, which is just short of imperial purple. Anything less red than violet is blue. The reader should note the incredible range in the blue tones itself, as also the point made earlier that what is a desirable shade in this range varies with the observer.

Again in the pink and red colours which Haworth-Booth describes in sequence, he starts with rose Bengal, a slightly purplish pink, then phlox pink the pink of cake icing, Tyrrian roses, rose madder (rose pink), Neyron rose, a warmer redder shade like the rose Paul Neyron and then crimson itself, the colour of Crimson Glory. Thereafter, and going redder still, we have turkey red. Coming to the pinks again, but this time pinks with an orange cast, we have shades like carmine rose (colour of the rose Picture), geranium lake (colour of Super Star), and thereafter scarlet (colour of Independence), and signal red (the colour of City of Belfast). Even more orange are mandarin red, the pure pomegranate colour, shrimp red soft orange, poppy red and fire red.

Again, among the yellows, starting with the green end, are shades like sulphur yellow (Etoile de Lyou), primrose yellow (Grandpa Dickson), Dresden yellow, canary yellow, (Diamond Jubilee), Indian yellow, Chinese yellow, saffron yellow, (Miss Harp), and maize yellow. If you go oranger still, we have shades like cadmium orange, followed by apricot (colour of Oldtimer), tangerine orange (the colour of Chantre), and orpement orange,

orange still-just a shade redder than the peel of a Nagpur orange.

So, readers should beware of the common habit of classifying roses in a highly mechanical manner as red, yellow, pink, etc., without regard to the nuances of shades and the combinations of light, transmitted and reflected, involved.

One other general observation which deserves emphasis. Particularly under Indian conditions, is the peculiar fascination for odd colours. Surely a black rose or a green rose is not the most desirable of rose colours? But this is what the novice asks for, much to the horror of a good rosarian. Obviously, he would not apply the standard of just being different if he was selecting girl friend!

What follows is an account of rose colours as I feel they should be perceived. I make no excuses for being dogmatic. Starting with red, which is, of course, the most popular of rose colours, the most beautiful shade, to my mind, is pure crimson, but with an underlay of black. A typical instance is Papa Meilland, or, in a cooler climate, the colour of Black Beauty. In their search for unfading reds, rose breeders seem to be giving too much importance to pure bright reds, for e.g. Olympiad, which has entirely lost richness in the absence of the black shading. Even worse are dull opaque reds of the type of Gladiator and Toro, to be condemned without a second glance, on this score alone, without going into their monstrous size.

In pinks, I feel some of the most beautiful shades are those in which the colour is blended and translucent. Some of the most eye-catching pink roses have this unique quality — Shot Silk, Picture, Tiffany, Michelle Meilland, but not that exhibitor's delight, First Prize with its blotchy matt finish.

Among the lilacs, my pet aversion is to lilacs edged pink, which excepting under ideal conditions makes for a very disagreeable contrast. Typical instances are Paradise and Angel Face, and even worse is Blue

Parfum. What chance have these when compared with the pure clear silver lilac of Sterling Silver, the slightly less translucent tone of Blue Moon, or in a cold climate, the shimmering violet effect of Ripples?

Coming to the yellow shades, the emphasis on darker and darker yellows is misplaced, which arises from the fact that the darker the shade, the more the carotenoid pigment and so, duller the effect. Some of the most beautiful yellow roses are those in the colours of Lemon Spice and Julien Potin, whereas darker roses like Bellona appear dull. Some of the most lovely yellow to orange shades are found in the Tea roses, for e.g. the luminous perfection of a bud of Lady Hillingdon is yet to be matched; though roses like Oldtimer or Vienna Charm do come close, though overlarge. One of the most lovely colours is the combined carotenoid-pelargonidin effect with the luminous translucence retained — of roses like Lover's Meeting and Belinda and Tanya.

Among the bicolours, red and white, and red and yellow, what I look for is a sharp demarcation of the colour spread. The very popular Double Delight suffers too often from the pink/red spreading on to the white, as the bud opens. Bicolours should also hold their colour without the colour contrast becoming strident as happens in Kronenburg in the second day after it opens when the pinkish red of the inner surface of the petals change to reddish purple.

Even within what appears to be as uncomplicated a colour as white, there is a great deal of variation. The pure snow white of the old Hybrid Perpetual, Frau Karl Druschki has yet to be bettered, though Honor does come close. But all too often, rosarians go into raptures over roses like Louisiana, which has a lot of cream, detracting from the purity of the white, or, horror of horrors, John. F. Kennedy, white unpleasantly tinged green. Of the white tinged pink roses, surely the most beautiful is Pristine, with its luminous pearl-like finish.

The strongest reactions of course occur to the strongest colours, and, to this day, vermillion roses are always a subject of controversy. The hot, orange-red colours, e.g. Independence, are, very often, too artificial to be really capable of being appreciated in a garden setting. To add to the unattractiveness, is the purple shading very often found on the outside of the petals of roses of such colour. In beautiful contrast, are the pastel vermillions such as Super Star, and attempts to improve on it by intensifying the vermillion really appear to me to be moves in the wrong direction.

So before I close, I would again reiterate that we rose growers must ever be careful not to shut the doors of perception, lest we become like one of my friends, who was a keen motorist and saw only three colours — red, amber and green!

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THE EYE OF THE BEHOLDER

M.S. Viraraghavan*

The saying 'Beauty lies in the eye of the beholder' has been repeated so often that it has become trite and commonplace. But what is not so obvious is why different eyes see so differently. This, however, becomes clear when we understand that perception is conditioned by numerous factors — sociological, cultural, historical and, last of all, the climate in which the observation is made. But this is not an article on what the eye sees in general, but one on perception of one aspect of the rose — its colour.

What we see as beautiful or desirable is definitely closely linked with sociological factors. An extreme example is the depiction of the Almighty as black and the Devil as white by certain central African tribes, in startling contrast to the traditional view. An example nearer home are the various theories to the effect, that the god Krishna, who is depicted as blue-black, is the god of the Dravidians. I do not wish to enter into this controversy, which has racial overtones, but merely mention it as an example of how different the perception of what is desirable can be, depending on the background of the person concerned.

Such extreme examples apart, there is a surprising degree of difference in the acceptability of various types of colours to different persons. A typical instance is the colour magenta, — including within it shades of colour from reddish-purple to lavender. We in India, and especially in South India, love the rich reddish-purple colours; but to an Englishman they are anathema. No magenta coloured rose has any hope of acceptance by the cognoscenti in the U.K., and even otherwise perfectly beautiful fragrant roses, like say Wendy Cussons, never quite made the grade on account of their magenta overtones. There is a simple historical or, perhaps, cultural factor involved, viz. that magenta

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was the colour of one of the first synthetic dyes evolved in the early years of the Industrial Revolution. So, cheap cloth in those days was coloured magenta, and looked at with disfavour by the prosperous. We see the hangover of this to this day.

Again, the climate has a profound impact in the acceptability of colour. In a cool, damp climate, what an Indian rosarian may consider a beautiful pure lilac, comes out too often as a muddy grey. Even within our country, the contrast between the appearance of a rose like Blue Moon in the warm, dry climate of Hyderabad and a cool damp climate of Kodaikanal has to be seen to be believed. Likewise, the beautiful Papa Meilland, with its exquisite shades of red underlaid darker — one of the favourite roses of the Indian plains — is much less attractive when the weather turns cold and damp — then the black underlay changes to an unacceptable shade of purple.

Without going into further detail on the variations of the perception of colour, it is important to refer to one very important factor, which is closely related to pigment composition and their ability to transmit or reflect light. The pigments of the rose have already been dealt with in several earlier articles in our Rose Annuals. But the important fact to be noted is the difference in luminosity arising from whether the coloration of a flower is due to a water soluble pigment or one which is insoluble in water. In roses, as is well known, the anthocyanin pigments — cyanidin and pelargonidin, contribute the red and vermillion colours. Yellow to orange shades are derived from water soluble flavonols — the yellow colour of the old Tea roses like Marechal Neil is entirely due to Flavonol. Another source of yellow colour — the source of the dark yellow to apricot tones are however the water insoluble carotenoid and anthocyanin is responsible for the startingly brilliant colours of modern roses.

But the point I would like to emphasize is that an excess of concentration of carotenoid very often leads, quoting Dr. David Leach, a well known authority not on roses, but on rhododendrons, 'to an opaque flower appearance without lustre or gloss'. In an interesting observation on what should be the ideal yellow rhododendron, which applies just as well to the ideal yellow rose, as rhododendron yellow colours are derived just as in roses from flavonol yellow and carotenoid yellow, Dr. David Leach says, 'ideally, reinforcement by carotenoids to the extent that luminosity is not lost would yield a combination of transmitted yellow light via the flavonols and reflected yellow light from the carotenoids: there would be a trade-off of some brightness and vibrancy for greater colour saturation.' (Journal of the American Rhododendron Society, Winter 1982). Carrying the argument further, we may observe that the glow which we associate with some of the most beautiful roses is because of the petal texture allowing transmission of light to some extent. This is very evident in some of the colours of the roses in the 'Hand-painted' strain.

In this background of extreme complexity in the perception of colour, it is quite amazing that we hear the observation, when someone is buying a rose plant, that he will not have, say for example, another red rose merely because he has a red already in his collection. Such insensitivity stems from what can only politely be called ignorance — the doors of perception have not yet been opened.

In contrast to this attitude is the vivid description of colours by the well known authority, Michael Haworth-Booth ('Effective Flowering Shrubs'), based on the colour charts of the Royal Horticultural Society, U.K. Dealing with the blues, Haworth-Booth remarks that only bees like the magenta colours — reddish purples or purplish pinks, ranging from Solferino purple and going bluer all the time through magenta itself — fuschian pink, fuschia purple, rhodamine purple, peony purple, mallow purple to cyclamen purple; next, and still going bluer all the time, we reach orchid purple and petunia purple, then onto mauve and imperial purple which are followed by the violets. This range of colours can be visualized if we think of the colours of roses starting from Swarthmore, Kanchi, Manou Meilland, Purple Beauty, Violaine, News, and the latest International Herald Tribune, which is just short of Imperial purple. Anything less red than violet is blue. The reader should note the incredible range in the blue tones itself, as also the point made earlier that what is a desirable shade in this range varies with the observer.

Again in the pink and red colours which Haworth-Booth describes in sequence, he starts with rose Bengal, a slightly purplish pink, then phlox pink the pink of cake icing, Tyrrian rose, rose madder, (rose pink), Neyron rose, a warmer redder shade like the rose Paul Neyron, and then crimson itself, the colour of Crimson Glory. Thereafter, and going redder still, we have Turkey red. Coming to the pinks again, but this time pinks with an orange cast, we have shades like carmine rose (colour of the rose Picture), geranium lake (colour of Super Star), and thereafter scarlet (colour of Independence), and signal red (the colour of City of Belfast). Even more orange are mandarin red, the pure pomogranate colour, shrimp red, soft orange, poppy red, and fire red.

Again, among the yellows, starting with the green end, are shades like sulphur yellow (Etoile de Lyon), primrose yellow (Grandpa Dickson), Dresden yellow, canary yellow, (Julien Potin), Empire yellow, aureolin, lemon yellow, straw yellow (Diamond Jubilee), Indian yellow, Chinese yellow, saffron yellow, (Miss Harp), and maize yellow. If you go oranger still, we have shades like cadmium orange, followed by apricot (colour of Oldtimer), tangerine orange (the colour of Chantre), and orpement orange, oranger still — just a shade redder than the peel of a Nagpur orange.

So, readers should beware of the common habit of classifying roses in a highly mechanical manner as red, yellow, pink etc., without regard to the nuances of shades and the combinations of light, transmitted and reflected, involved.

One other general observation which deserves emphasis, particularly under Indian conditions, is the peculiar fascination for odd colours. Surely a black rose or a green rose is not the most desirable of rose colours ? But this is what the novice asks for, much to the horror of a good rosarian. Obviously, he would not apply the standard of just being different if he was selecting a girl friend !

What follows is an account of rose colours as I feel they should be perceived — I make no excuses for being dogmatic. Starting with red, which is, of course, the most popular of rose colours, the most beautiful shade, to my mind, is pure crimson, but with an underlay of black. A typical instance is Papa Meilland, or in a cooler climate, the colour of Black Beauty. In their search for unfading reds, rose breeders seem to be giving too much importance to pure bright reds, for e.g. Olympiad, which has entirely lost richness in the absence of the black shading. Even worse are dull opaque reds of the type of Gladiator and Toro, to be condemned without a second glance, on this score alone, without going into their monstrous size.

In pinks, I feel some of the most beautiful shades are those in which the colour is blended and translucent. Some of the most eye-catching pink roses have this unique quality — Shot Silk, Picture, Tiffany, Michelle Meilland, but not that exhibitor's delight, First Prize with its blotchy matt finish.

Among the lilacs, my pet aversion is to lilacs edged pink, which excepting under ideal conditions makes for a very disagreeable contrast. Typical instances are Paradise and Angel Face, and even worse is Blue Parfum. What chance have these when compared with the pure clear silver lilac of Sterling Silver, the slightly less translucent tone of Blue Moon, or in a cold climate, the shimmering violet effect of Ripples?

Coming to the yellow shades, the emphasis on darker and darker yellows is misplaced, which arises from the fact that the darker the shade, the more the carotenoid pigment and so, duller the effect. Some of the most beautiful yellow roses are those in the colours of Lemon spice and Julien Potin, whereas darker roses like Bellona appear dull. Some of the most lovely yellow to orange shades are found in the Tea roses, for e.g. the luminous perfection of a bud of Lady Hillingdon is yet to be matched; though roses like Oldtimer or Vienna Charm do come close, though overlarge. One of the most lovely colours is the combined carotenoid-pelargonidin effect with the luminous translucence retained — of roses like Lover's Meeting and Belinda and Tanya.

Among the bicolours, red and white, and red and yellow, what I look for is a sharp demarcation of the colour spread. The very popular Double Delight suffers too often from the pink/red spreading on to the white, as the bud opens. Bicolours should also hold their colour without the colour contrast becoming strident as happens in Kronenbourg in the second day after it opens when the pinkish red of the inner surface of the petals change to reddish purple.

Even within what appears to be as uncomplicated a colour as white, there is a great deal of variation. The pure snow white of the old Hybrid Perpetual, Frau Karl Druschki has yet to be bettered, though Honor does come close. But all too often, rosarians go into raptures over roses like Louisiana, which has a lot of cream, detracting from the purity of the white, or, horror of horrors, John. F. Kennedy, white unpleasantly tinged green. Of the white tinged pink roses, surely the most beautiful is Pristine, with its luminous pearl-like finish.

The strongest reactions ofcourse occur to the strongest colours, and, to this day, vermillion roses are always a subject of controversy. The hot, orange-red colours, e.g. Independence, are, very often, too artificial to be really capable of being appreciated in a garden setting. To add to the unattractiveness, is the purple shading very often found on the outside of the petals of roses of such colour. In beautiful contrast, are the pastel vermillions such as Super Star, and attempts to improve on it by intensifying the vermillion really appear to me to be moves in the wrong direction.

So before I close, I would again reiterate that we rose growers must ever be careful not to shut the doors of perception, lest we become like one of my friends, who was a keen motorist and saw only three colours — red, amber and green !

ON THE SCENT OF "SCENT"

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No Indian would seriously dispute what Shakespeare has to say on fragrance and the rose, or quarrel with what is suggested by Sean McCann when he says that "fragrance is the heart of the rose; it is the rose's most wonderful asset; let's put it back again. I know that it isn't easy to say,' I'm going to breed a fragrant rose here' - but it might be worth a try. At present most hybridisers work with varieties that provide health, growth and good blooms. Now let them start working on fragrance too with the same enthusiasm[1].

How does one start breeding for fragrant roses, especially when many modern varieties, otherwise colourful and beautiful are utterly lacking in fragrance? If we recall that fragrance is generally a recessive characteristic, and take into account the fact that rose hybridization has concentrated on other aspects, this would seem to be very difficult indeed. But the problem is not really all that intractable - as is evident if we analyse the breeding lines which have contributed to the fragrant roses of today[2].

Relying on Sean McCann again, some of today's most fragrant bush roses are Scented Air, Ena Harkness, Fragrant Cloud, Margaret Merrill, Fountain, Royal Gold, Radox Bouquet and Double Delight; and among the climbers, Compassion, Breath of Life, and Rosy Mantle. To this list we may add Papa Meilland, Oklahoma, Sutter's Gold, Tiffany and Lemon Spice as among the most fragrant roses grown in India. As I said earlier, the source of fragrance becomes more obvious if we analyze the breeding lines, but what is very interesting, if not sensational is the fact that…….. no, I won't ruin a good detective story by revealing the denouement in the beginning!

The quest for the source of fragrance, as shown by the analysis which is detailed below, starts with the famous parent rose, Lady Mary Fitzwilliam, raised by the pioneering English hybridiser, Henry Bennett in 1882. A cross of Devonienses, a Tea rose which is still widely grown in India, and Victor Verdier, an early Hybrid Perpetual, this rose, flesh pink in colour is described as very large, globular and very fragrant.

Starting with Lady Mary Fitzwilliam the two giant steps taken to produce the fragrant line were the release of the H.T., Mme. Caroline Testout in 1890 - a rose so popular in its time that it was once planted by the thousands along the streets of Portland, Oregon, U.S.A. - and the raising of Ophelia (1912), which, with its numerous sports, was the standby of the cut flower trade for nearly two decades. Mme. Carolina Testout led via Catherine Kordes (1930), to the production of one of the most fragrant of red roses, Crimson Glory in 1935, at the hands of Wilhelm Kordes. An interesting feature is that the progenitor of Crimson Glory, Catherine Kordes, could also be linked to Ophelia via the red H.T. Sensation (1922).

Leaving the line starting with Lady Mary Fitzwilliam for the present, another major development which contributed to the evolution of fragrant roses was the raising of the first rose with the 'blood' of the Persian yellow - Soleil d'Or, in 1900[3]. The cross was between Antoine Ducher, a Hybrid Perpetual released in 1866 and the Persian yellow rose, a semi-double mutant of *Rosa foetida*, the golden rose of Persia. Further hybridization with Soleil d'Or led, in the hands of the great French hybridizer, Pernet

Ducher, to the introduction of one of the most famous of yellow roses, Souvenir de Claudius Pernet in 1920, which in turn, produced further on yellow/bicolour roses such as Julien Potin (1927), Talisman (1929), and Soeur Thérèse (1931). Curiously enough, Crimson Glory, via Catherine Kordes, was not only the meeting point of the lines starting from Mme. Caroline Testout and Ophelia, but included a direct link with Soleil d'Or, Crimson Glory apart, a rose of great importance in the development of rose fragrance is the glamorous Signora (1936), a breathtaking medley of orange apricot, suffused gold, with an incomparable fragrance - a rose which I have grown but, alas, lost. It will probably not come as too much of a surprise if I say that the parentage of this rose too can be traced to Ophelia via Sensation, as also to Soleil d'Or via Julien Potin.

The third of this trio of important parent roses in Charlotte Armstrong, a pink H.T. (1940) derived from Crimson Glory, and again including a direct link to Soleil d'Or, this time via Souer Therese.

Before taking up the parentage of the fragrant roses of today, one more very influential rose should be mentioned - viz., Peace, (1945), which again is in the direct line from Soleil d'Or via Souvenir de Claudius Pernet.

What then is the link between these roses - Crimson Glory, Signora, Charlotte Armstrong and Peace - to today's fragrant roses? Starting with reds, we may note that Ena Harkness (1946) (one of the two red roses in Sean McCann's list quoted earlier) is directly derived from Crimson Glory. Also derived from Crimson Glory via Charlotte Armstrong, are the further advances in red roses - Papa Meilland (1963), Oklahoma (1964) and Mr. Lincoln (1964). Another very fragrant rose, still widely grown, Sutter's Gold, (1950), is similarly derived from Charlotte Armstrong, intercrossed with Signora. One more scented rose, Tiffany, (1954), is from Charlotte Armstrong, to which is added the influence of Talisman, which you may note, is directly in the line from Soleil d'Or, and also, a direct derivative of

Ophelia. Again, Lemon Spice (1966) is Charlotte Armstrong combined with Julien Potin. To bring the story almost up to the present, Double Delight, (1977), is derived from Charlotte Armstrong, with a dose of Tiffany, and from Soleil d'Or' via Peace.

Going back to Peace, we may note that perhaps the most fragrant of all roses, Fragrant Cloud (1963), is in the direct line from Peace via Prima Ballerina (1957). Unfortunately, the full parentages of Prima Ballerina and Fragrant Cloud have not been revealed by the raiser, Matthias Tantau, but we may infer, as being roses released almost simultaneously with Super Star (1960), by the same raiser, and in the same colour range, that the parentage is quite similar[4]. It will at this stage come as no surprise that the parentage of Super Star can be directly linked to Mme. Caroline Testout, Crimson Glory and Soleil d'Or - i.e. the mixture as before, to which is added the influence of two rose species, *Rosa multibracteata* and *Rosa roxburghii* - entering the 'bloodline' for the first time. We can guess that this combination of genes and, particularly, the infusion of fresh blood via the two rose species is responsible for that special and characteristic intensification of fragrance in Fragrant Cloud, which is a fragrance very distinct indeed from the damask fragrance of Crimson Glory.

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Other scented roses in McCann's list are traceable to the same lines - Breath of Life (climber) to Ena Harkness, and Scented Air to Charlotte Armstrong and to Crimson Glory more directly via the Floribunda, Fashion (1949), the parentage of which is also directly traceable to Ophelia and to Julien Potin.

This brings us to the subject of fragrant floribundas, most of which can be traced back to Fashion. From Fashion came two important floribundas, Spartan (1955), and Little Darling, (1956). From Spartan comes Elizabeth of Glamis (1965), the first floribunda ever to win the Fragrance Cup of the Royal National Rose Society.

So what does this analysis of the parentage of fragrant roses reveal? Quite clearly, almost all the roses in Sean McCann's list, or the others mentioned by me at the beginning of this article, are in the direct line from Mme. Caroline Testout and Ophelia. But what is intriguing - and, of course, this is again mere speculation - is that the quality of fragrance seems to be much enhanced when a new species is brought in. This has happened on several occasions. Initially, when the blood of *R. foetida* came in; again, when *R. multibracteata* and *R. roxburghii* were brought in into the Fragrant Cloud line; once more when *R. rubiginosa* was added to the mix to create Margaret Merrill; and again, when *R. spinosissima* and *R. rubiginosa* were both added to evolve Radox Bouquet. And yet again, when the fragrant flouribunda roses were evolved by adding a dash of the polyantha genes. What then is the prescription for breeding a fragrant rose? In my view, but of course I am sticking my neck out here, we should concentrate on raising roses from Fragrant Cloud, Double Delight, and most of all, from Margaret Merrill, inter-crossed with others of similar genetic background; but to finish in ablaze of controversy, may I say that even more spectacular results would hopefully emerge if we bring in new rose species into these lines.

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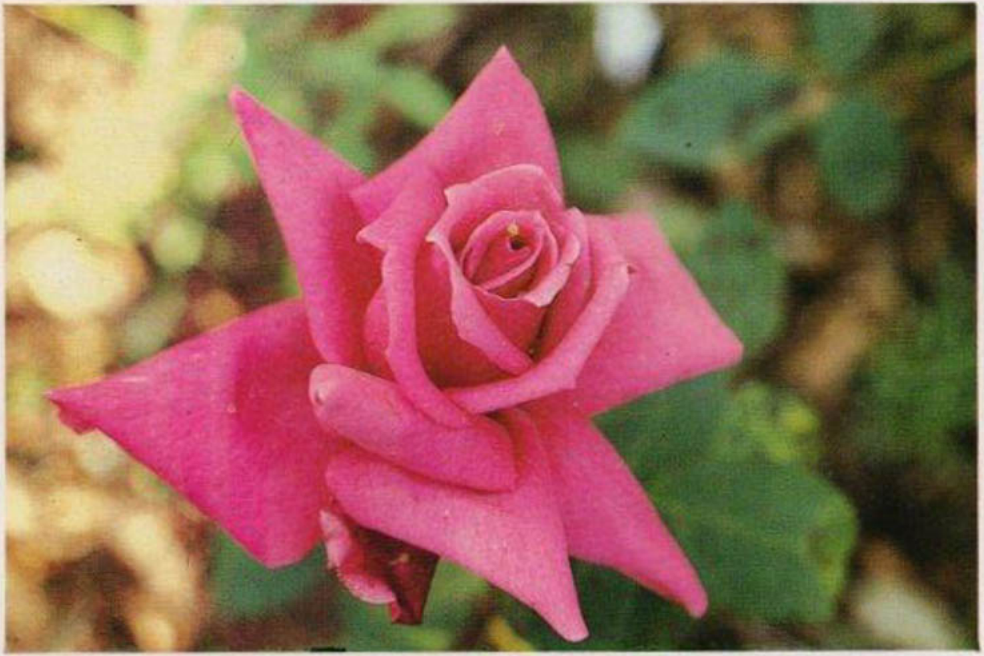
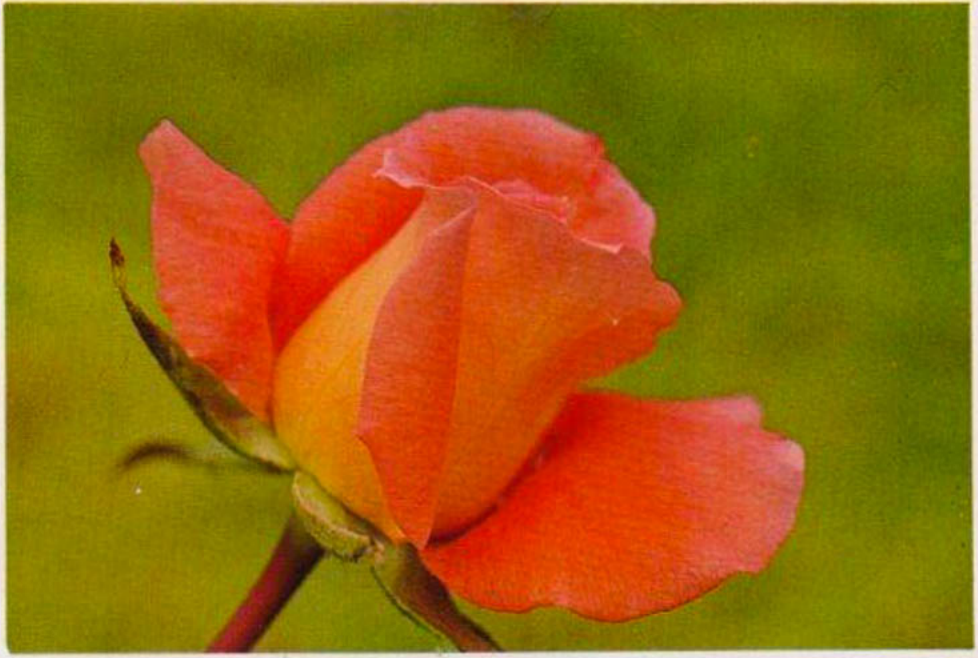


VAMSADHARA — H. T.   M. S. Viraraghavan
Introduced K. S. G. Son. 1988
(Seedling × Silver Star)



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Other scented roses in McCann's list are traceable to the same lines - Breath of Life (climber) to Ena Harkness, and Scented Air to Charlotte Armstrong and to Crimson Glory more directly via the Floribunda, Fashion (1949), the parentage of which is also directly traceable to Ophelia and to Julien Potin.

This brings us to the subject of fragrant floribundas, most of which can be traced back to Fashion. From Fashion came two important floribundas, Spartan (1955), and Little Darling, (1956). From Spartan comes Elizabeth of Glamis (1965), the first floribunda ever to win the Fragrance Cup of the Royal National Rose Society.

So what does this analysis of the parentage of fragrant roses reveal? Quite clearly, almost all the roses in Sean McCann's list, or the others mentioned by me at the beginning of this article, are in the direct line from Mme. Caroline Testout and Ophelia. But what is intriguing - and, of course, this is again mere speculation - is that the quality of fragrance seems to be much enhanced when a new species is brought in. This has happened on several occasions. Initially, when the blood of R. Foetida came in; again, when R. Multibracteata and R. Roxburghii were brought in into the Fragrant Cloud line; once more when R. Rubiginosa was added to the mix to create Margaret Merrill; and again, when R. Spinosissima and R. Rubiginosa were both added to evolve Radox Bouquet. And yet again, when the fragrant flouribunda roses were evolved by adding a dash of the polyantha genes. What then is the prescription for breeding a fragrant rose? In my view, but of course I am sticking my neck out here, we should concentrate on raising roses from Fragrant Cloud, Double Delight, and most of all, from Margaret Merrill, intercrossed with others of similar genetic background; but to finish in a blaze of controversy, may I say that even more spectacular results would hopefully emerge if we bring in new rose species into these lines.

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IN MEMORIAM
Dr. B. P. Pal
1906 – 1989

M. S. Viraraghavan

'The gate of life swings to and fro,
Soon, too soon, it closes,
And that is why, beside my door,
I grow red roses'

Rose lovers in India and elsewhere were greatly saddened by the passing away of Dr. B. P. Pal on 14th September 1989. The end came after a fall on the staircase in his house, which he must have used safely so often in the past, on his way to his beloved terrace rose garden, adjoining his upstairs bedroom.

Those of us who were privileged to know him over a period of years might have felt a sudden chill - your Editor certainly did - when Dr. Pal closed his article in our Rose Annual VI with the quotation given above. But rosarians are incurable optimists, and the thought was soon dismissed. But by hindsight we could perhaps say that Dr. Pal himself had felt that the end was near.

Dr. Pal was a man of varied accomplishments - one of India's most eminent agricultural scientists, endowed with the uncommon gift of translating scientific ideas into practical action, as well as unusually gifted in his sensitivity to men and matters, to which was added an innate but striking feel for beauty.

But we are here primarily concerned with Dr. Pal and the rose - his other accomplishments are detailed elsewhere in this Annual, in the I.R.F. citation prepared on the occasion of presenting him with the Vijay Pokarna Gold Medal in December 1988.

As a young man keenly in love with roses, I remember visiting Dr. Pal's Rose Garden in the Indian Agriculture Research Institute, well over 30 years ago. It was early spring of Delhi and everywhere the roses were in bloom - roses as bushes, as climbers, and, most eyecatching of all, as standard roses underplanted with bright blue pansies, with that loving eye for detail so characteristic of him; Dr. Pal. while looking at his roses, was obviously keenly enjoying the scene, yet there was at the same time a somewhat puzzling but manifest glow, even when he was not apparently looking at the flowers. Over the years I have come to realize that this was occasioned by a lovely mental vision of roses, which must have been present most of the time. Even in later years, when reduced to growing roses in a small terrace on the upstairs of his modest post-retirement house, he would always make it a point to show visitors around - even during the height of summer when there were no flowers at all. Obviously he expected those with him to have that same vivid mental picture of roses to come.

Indian rose lovers were indeed most fortunate that Dr. Pal became Director of the I.A.R.I. at a critical phase just after Independence. Largely owing to his initiative and the life-long love for roses - he had been growing roses even as a young boy in Burma - he was instrumental in starting the Department of Horticulture, later Floriculture. Mind you, this was done at a time when rose growing, or for that matter, flower growing, was considered elitist - it still is, to some extent, forgetting the compelling truth that a flower is the simplest, and therefore, the purest symbol of love or reverence available to even the humblest.

A second pioneering achievement of Dr. Pal was the starting of the Rose Society of India, which has done so much to popularize rose growing in the country.

In a way, more important than the contribution of the I.A.R.I. to rose research, were Dr. Pal's personal efforts at an amateur level. I cannot resist borrowing Jack Harkness's apt description of another rose breeder - Alec Cocker, and applying it to Dr. Pal - as a person "whose heart was wrapped up, strung, knotted and posted off to the Goddess of New Roses". He himself had stated, with becoming modesty, that his rose breeding was with a view to raise roses better suited for areas like Delhi.

But we should not forget that Dr. Pal as a rose breeder represented an unique combonation of an agricultural sclentist with a background of many years in plant breeding, a lover of roses with a critical appreciation of the beauty of the rose developed over the years, as well as an artist endowed with an uncommon sensitivity to form and colour. The roses raised by him, besides setting a new standard in Indian bred roses, are a clear pointer to what is possible in the future, when, hopefully, roses raised in India will dominate the show benches - as they ought to.

Remarkably enough, though roses were a kind of religion with him, Dr. Pal would never allow intensity of fealing to upset his equanimity and balance. An object lesson in these days of abrasive sanctimoniousness, was his handling of the provocative and unnecessary references to the working of the Rose Society of India, which must have hurt him deeply, during a meeting at Bombay, by his hosts who seemed oblivious that the success of the occasion was largely due to his presence.

His unflappable graciousness concealed a painstaking and meticulous attention to every detail concerning the rose, forgetting physical limitations. I still remember judging roses with him during the Winter Show of the Rose Society of India in December 1988 when, despite obviously not being well, he insisted on closely inspecting each and every exhibit, displaying a patience which could not be matched by those much younger than him.

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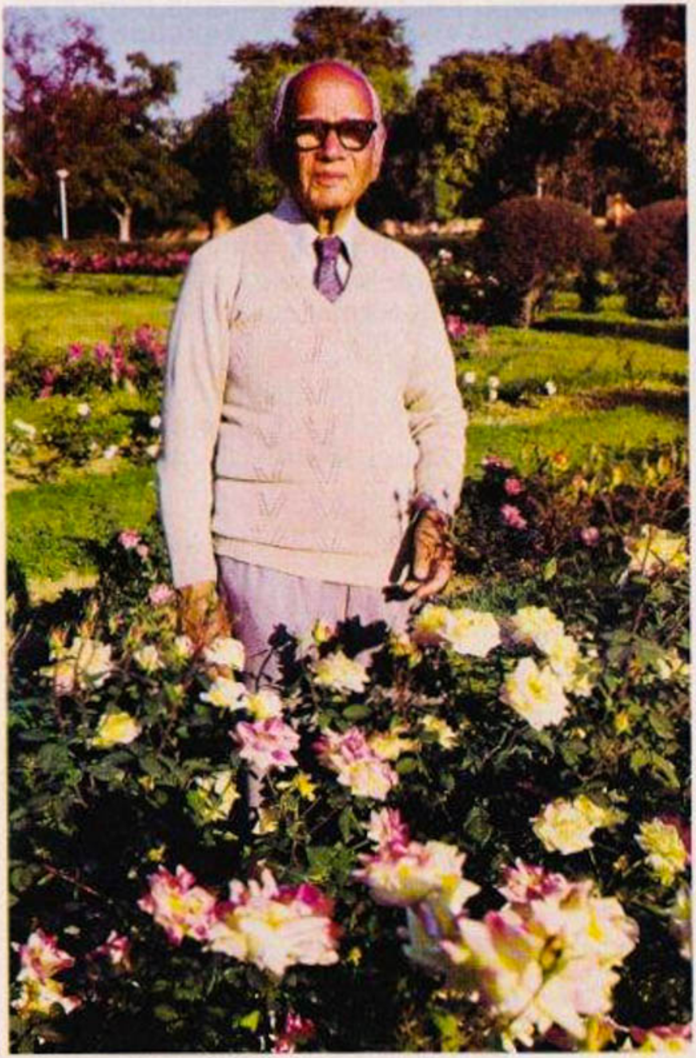
Indian Rose Annual 1989



Dr. B. P. Pal among his beloved roses

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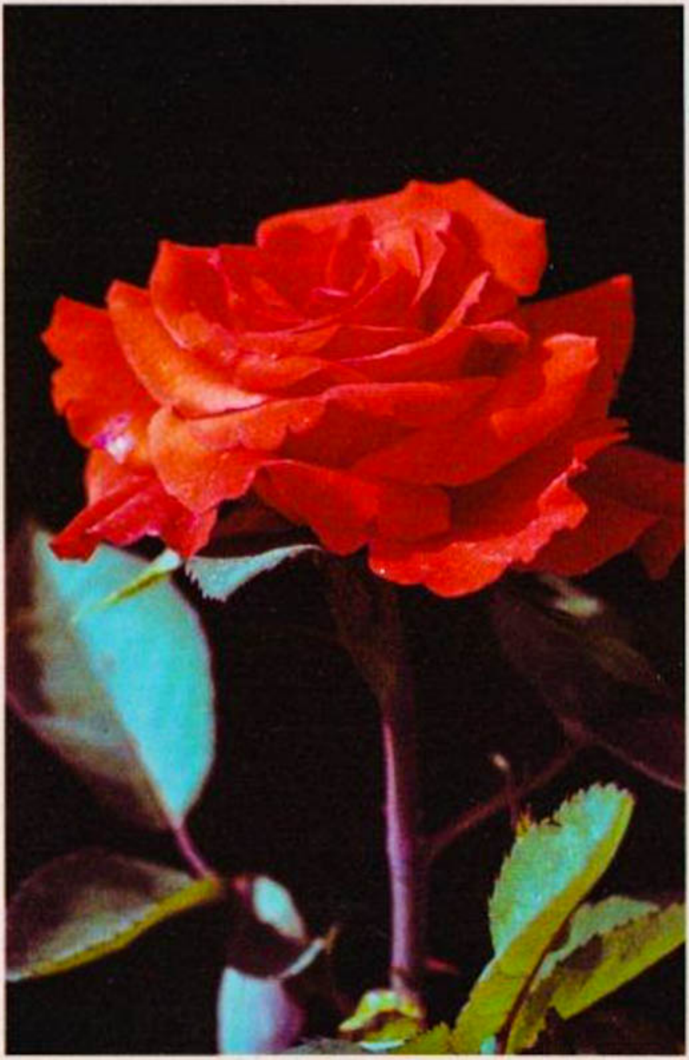

C. V. Raman - H.T. B. P. Pal
SCARLET KNIGHT x FIRST PRIZE
Released on the occasion of Sir C. V. Raman's birth centenary.

Indian Rose Annual - IRA 1991

ROSE BREEDING FOR THE TROPICS

M. S. Viraraghavan

Producing better roses for India and other tropical regions is indeed a challenging task. In addition to the normal difficulties of any plant breeding programme, warm climate rose breeding carries with it the daunting implication of having to deliberately reverse the conscious process of selection for resistance to cold, or winter hardiness, which has been basis of Western rose breeding for well over 100 years.

Broadly speaking, two approaches are feasible :

1. Evolving a strain of heat resistant roses starting with standard modern roses e.g. Montezuma, or heritage roses e.g. Gruss an Teplitz, with good performance in warm climates.
2. Breeding with tropical rose species, *Rosa clinophylla* (*Rosa involucrata*)[1] and its near relative, *Rosa bracteata*.

In this paper an attempt is made, in summary form, to set out the results achieved by adoption of these two alternate strategies of rose breeding in the light of work done, and observations made by various Indian rose breeders including the work done by the author from 1966 onwards.

A disclaimer or a plea for anticipatory bail would be in order, before we begin this article which, while striving for scientific accuracy to the extent information is available is unashmedly from the point of view of the practical horticulturist. As such inclusion of a certain amount of material based on intuition or 'feel' has become inevitable. In fact, without this element, it is difficult to do justice to the subject of rose breeding. May I add that this is not just the author's view - that the mechanics of rose breeding are easy enough, but that the flair for the right cross Is not so - but is one well supported by various well known authorities e.g. Sanday[3].

One other important factor, which has to be taken note of is the great variation in climate which exists within the tropics and, for that matter, within India itself. One authority, Sunil Jolly, has divided India into 10 agroclimatic zones for growing roses, and, in the ultimate analysis, separate breeding lines would be required for each of these 8 zones : [4.5].

While on the subject of breeding tropical roses, adopting strategy 1, viz. working with standard/heritage varieties, which have performed well in the Indian climate, it is appropriate to begin with the work of Sri. P. Bhatcharji. Apart from being probably the first Indian rose breeder to recognise the need to create a separate line of heat resistant roses, Sri. Bhatcharji has the distinction of putting his theories into practical application by raising a large number of roses which were very well adapted to the agroclimate he was working in. Unfortunately not much information is available on the parentages of the roses raised by Sri. P. Bhatcharji; but it would appear that several of the hardy Hybrid Perpetuals, as well as varieties like the China polyantha rose, Cecile Brunner, other China/Polyantha roses, and some Tea roses, were utilized; e.g. his varieties Muktadara (satin pink Floribunda) and Toohin (white Floribunda) appear to be derived from Cecile Brunner, while his apricot Hybrid Tea Raja Ram Mohan Roy appears to be linked with the Tea roses.

A serious effort to create such a line was initiated by the author from 1966 onwards. Among the varieties so chosen for the work were the China/Polyantha rose, Cecile Brunner, several of the Tea roses such as Catherine Mermet, Madame Falcot, and Etoile de Lyon, all of which are diploid. Other choices were the Bourbon rose, Rose Edward, and the Hybrid Musk, Prosperity, both of which are triploid, and the Hybrid Tea (Bourbon?) Gruss an Teplitz, which is a tetraploid. These varieties were intercrossed with a wide variety of garden roses, ranging from Polyantha/Miniatures, to standard large flowered Hybrid Teas/Floribundas, as also some climbers.

Table I sets out the work done on some of these varieties viz. Cecile Brunner and Catherine Mermet (diploid), R. Edward (triploid), and Gruss an Teplitz (tetraploid).

As is evident from the table, work with Cecile Brunner resulted in almost complete failure, except for the solitary pair of seedlings with the Polyantha, The Fairy. By hindsight it is quite evident that such a result should have been expected when crossing a diploid rose with mainly tetraploid garden roses. But there is yet scope to utilize Cecile Brunner, which, as many would confirm, is indeed very well adapted to different regions of India, in work with *R. clinophylla*, which is dealt with later. From (Catherine Mermet (?) x Samba), came the dwarf red Floribunda, First Offering.

Again, work with R. Edward did not lead to any tangible results. Nor did crosses with Prosperity - results which also could have been forecast, since triploid roses are inherently difficult to work with.

Fortunately, work with Gruss an Teplitz was much more rewarding and the author's lilac Hybrid Tea, Vanamali, the dark Pink Hybrid Tea, Kanchi, the pink Floribunda, Amrapali, are all derived from this line. In the next generation from Gruss an Teplitz has appeared the red Grandiflora, Achanta, from a cross with Kanchi.

Other rose breeders have also achieved some results using Gruss an Teplitz; e.g. Dr. Pal's Rose Sherbet, the Floribunda, Rosemary Rose, from which is derived the very popular red Floribunda Europeana (de Ruiter).

Another angle to the raising of heat resistant roses is the utilization of standard modern varieties of the type of Montezuma (well adapted to almost all the climates in India), Garden Party (at its best in cool, dry regions), Maria Callas (well adapted throughout India), and others too numerous to mention, specifically adapted for various agroclimatic zones.

One of the early successes using Montezuma was the author's Kanyakumari a repeat flowering climber in the salmon pink range of colour. Further work with Montezuma Maria Callas suffered a setback on account of the shift to Kodaikanal in 1980 from Hyderabad, where these varieties do not perform well. But there is little doubt that such an approach would be of great value and results could be achieved much more easily than when working with the heritage varieties.

Table: 1

Results of Hybridisation with Cecile Brunner, Catherine Mermet, Rose Edward & Gruss an Teplitz 1966 – 1969						
S. No.	Pollen Parent	Seed Parents	No. of Crosses	Hips Harvested	Seedlings Germinated	Remarks
		(Illustrative List)				
1.	CECILE BRUNNER (Polyantha)	POLYANTHAS 1. Mr. BLUE BIRD 2. THE FAIRY HYBRID TEAS	213	48	5	Work done at Nizamabad (Deccan Plateau) and Madras (EastCoast), only 2 seedlings from the cross Cecile Brunner x The Fairy found useful for further work.
2.	CATHERINE MERMET (?) (Tea)	1. KING'S RANSOM 2. TAPESTRY 3. INDEPENDENCE FLORIBUNDAS	125	51	10	Work done at Nizamabad (Deccan Plateau). One seedling (Catherine Mermet (?) x Samba) was introduced as red Floribunda, “FIRST OFFERING“
3.	R. EDWARD (Bourbon)	1. LILAC CHARM 2. EUROPEANA	335	40	43	Work done at Nizamabad (Deccan Plateau) and Madras (EastCoast) and Hyderabad (Deccan Plateau). Seedlings generally very inferior, excepting for a cross (R. Edward x Golden Showers) from which 3 fragrant seedlings emerged.
4.	GRUSS AN TEPLITZ (Hybrid Tea/Bourbon)		305	88	Details misplaced	Work done at Madras (East Coast). From these crosses arose KANCHI (dark pink Hybrid Tea), and in a later generation VANAMALI (Lilac hybrid Tea) and AMRAPALI (Pink Floribunda)

As regards heritage varieties, we should observe that, apart from problems caused by diploid/triploid chromosome number, these varieties, in general, do not possess disease resistance as such. They appear to owe their longevity, under Indian conditions, more to disease tolerance, and the ability to recover from severe infection without special care or protective spraying. Varieties such as R. Edward and Cecile Brunner, though hardy, are exceedingly susceptible to mildew and this fault is much more pronounced in further generations raised from them.

Unfortunately, the same is true, by and large, of the Tea roses, which combine a moderate resistance to Black Spot with a great susceptibility to mildew (under Hyderabad conditions).

In passing, we should mention that the results with the heritage varieties appear a little more discouraging than perhaps might be the case, if it had been possible to *do* the work on a sustained basis in the same agroclimatic zone.

Coming to strategy II, i.e. hybridization with the tropical rose species, *R. clinophylla* (*R. involucrata*), possibilities in this direction have been pointed out by E.F. Allen[2]. But we cannot resist mentioning that the author's attempt ten years earlier in 1967, to obtain plants of *R. clinophylla* from the Botanical Survey of India, Sibpur, ended in failure, as *R. multflora* was sent from the gardens labelled as '*R. clinophylla*', and, ignorance compounded by a belief in the infallibility of the Botanical Survey of India led to several years being wasted before the mistake was discovered.

The strategy advised by Allen was to intercross *R. clinophylla* with varieties of the type of Tea/Noisette, Lamarque, which does well in many parts of the tropics. Allen observes that as is normally the case, the F_2 generation between a species and a continuous flowering hybrid is likely to be once flowering, but this could be overcome in subsequent generations, raised by setting or backcrossing to Lamarque, to yield recurrent, flowering climbers. According to him, a further generation raised by crossing such recurrent flowering climbers with fertile diploids would yield dwarf bedding roses suitable to the tropical climate.

The final step would be to cross the resultant diploid hybrids with selected standard tetraploid garden roses, which would yield initially, triploids of low fertility, but eventually tetraploids would arise by much the same process through which they have evolved in temperate regions, among Hybrid Teas and Floribundas.

Before taking up an analysis of the results achieved with *R. clinophylla*, it would be useful to briefly describe the features of this species and its distribution in India.

The species is described by Dr. Pal in his well known book, 'The Rose in India' as a 'stout, erect or semi-climbing shrub, flowers white, single, borne singly or in clusters, fruits roundish, hairy and pale. Distribution throughout India, especially in the plains of Bengal' [6]. 'The foliage is light green, deeply veined with 5-7 leaflets with an apex leaflet considerably elongated, oblong lanceolate in shape. The curious involucras i.e. groups of bracts enveloping the young inflorascences are another feature by which the species can be easily recognised'

According the classification adopted by Darlington, it is the only other member of the subgenus[8]. Bracteatae, of the genus Rosa, the other member being *R. bracteata*, native of South China and Upper Burma. Even from the horticulturist's point of view, the close resemblance between the two species is strikingly obvious. Under Kodaikanal conditions *R. bracteata* is, by far, the superior plant, possessing as it does, two very interesting, indeed, unique features :

1. Virtual immunity to mildew/black spot
2. Capacity to flower continuously.

As such, work on *R. bracteata* has been carried on simultaneously with that on *R. clinophylla*, with the expectation that the progeny would be easily intercrossable and the superior qualities of *R. bracteata* incorporated in the strain from the beginning itself.

Work started in 1985 with a clone of *R. clinophylla*, collected in the wild near Ranchi, Bihar State. Other; clones have been reported from the Farakka Barrage area in West Bengal[9] and from the Mount Abu area in Rajasthan[10].

In the initial years the work was carried on using *R. clinophylla* and *R.*

bracteata as pollen parents, following the recommendations of E.F. Allen[2], that the cross, (cultivar x speices) is more likely to succeed rather than the reverse. The seed parents employed included eight varieties of Tea and Noisettle roses, provisionally identified as Marie van Houtte, Jean Ducher, Mrs. B. R. Cant (3 forms), Bouquet d'Or, Safrano, Lamarque, Celine Forestier, Marechal Neil; the polyanthas, Cecile Brunner Perle d'Or, Baby Farraux and Gloria Mundi; as well as certain Floribundas/Hybrid Teas which are exceptionally fertile under Kodaikanal conditions viz., Little Darling, Queen Elizabeth, Independence, Lover's Meeting and Julien Potin.

It can be seen that the first group are diploids, as is *R. clinophylla*, and the second group are all tetraploids. The results achieved are available in Table II.

An analysis of Table II clearly indicates that under Kodaikanal conditions utilizing *R. clinophylla* and *R. bracteata* as pollen parents, is not likely to yield tangible results. The crosses of *R. clinophylla* and *R. bracteata* with Polyanthas have been uniformly a failure. As regards crosses with Teas, only three seedlings have been raised with *R. clinophylla* of which two (T_5 Marie van Houtte? x *R. clinophylla*) and (T_4 Mrs. B. R. Cant? x *R. clinophylla*) have not yet flowered, even in the third season after germination. Seedling No. 3 (T_4 Mrs. B. R. Cant? x *R. clinophylla*) appears more promising as it is dwarf and has flowered twice with single white flowers of the type of *R. clinophylla* in the first season after germination.

Table: IIa

CROSSES WITH R. CLINOPHYLLA AS POLLEN PARENT : 1985 – 1989

S. No.	Seed Parents	No. of Crosses	Hips	Seed	Seedlings	Remarks
1.	T_1 (Madame Hoste?), Tea	5	--	--	--	
2.	T_2 (Boquet d'Or ?), Tea	9	--	--	--	
3.	T_3 (Safrano?), Tea	14	13	6	--	
4.	T_4 (Mrs. B. R. Cant), Tea	23	17	27	2	of the 2, one has flowered (see text)
5.	T_5 (Marie Van Houtte?), Tea	16	4	13	1	
6.	T_6 (Jean Ducher?), Tea	8	1	5	--	
7.	T_7 (Celine Forestier?) ,Tea	6	--	--	--	
8.	Lamarque, Noisette	26	20	--	--	
9.	Marechal Niel, Noisette	2	--	--	--	
10.	Cecile Brunner, Polyantha	28	11	--	--	
11.	Perle d'or, Polyantha	30	10	--	--	
12.	Gloria Mundi, Polyantha	7	7	1	--	Too early. Gemination may occur
13.	Echo, Polyantha	4	--	--	--	
14.	Gold Topas, Floribunda	2	--	--	--	
15.	Little Darling, Floribunda	10	6	20	--	
16.	Independence, Hybrid Tea	7	5	8	--	
17.	Queen Elizabeth, Hybrid Tea	4	4	6	--	

Note: ? Identification provisional

Table: IIb

CROSSES WITH R. BRACTEATA AS POLLEN PARENT : 1985 – 1989

S. No.	Seed Parents	No. of Crosses	Hips	Seed	Seedlings	Remarks
1.	T_1 (Madame Hoste?), Tea	1	--	--	--	
2.	T_2 (Boquet d'Or ?), Tea	4	--	--	--	
3.	T_3 (Safrano?), Tea	8	6	5	--	Only 1 survived. This is a dwarf single
4.	T_4 (Mrs. B. R. Cant), Tea	26	17	47	6	
5.	T_5 (Marie Van Houtte?), Tea	6	3	13	--	
6.	T_6 (Jean Ducher?), Tea	1	--	--	--	
7.	T_7 (Celine Forestier?), Tea	4	7	--	--	
8.	Marechal Niel, Noisette	1	--	--	--	
9.	Lamarque, Noisette	15	--	--	--	
10.	Lady Hillingdon, Tea	3	3	--	--	
11.	Cecile Brunner, Polyantha	2	--	--	--	
12.	Laurette Messimy, China	4	--	--	--	
13.	Rise 'n' Shine, Miniature	8	--	--	--	
14.	O'er The Rainbow, Miniature	5	2	5	--	
15.	Mini Cocktail, Miniature Seedling	16	11	1	--	
16.	Little Darling, Floribunda	27	22	50	1	Single, cream coloured flower of Floribunda type
17.	Baby Faurax, Polyantha	32	9	6	--	
18.	International Herald Tribune, Hybrid Tea	3	--	--	--	
19.	R. clinophylla, Species	76	70	230	45	

Table: III

CROSSES WITH (R. Clinophylla x R. Bracteata) B as Pollen Parent

S. No.	Seed Parents	No. of Crosses	Hips	Seed	Seedlings	Remarks
1.	T_2 (Boquet d'Or ?), Tea	2	--	--	--	
2.	T_4 (Mrs. B. R. Cant), Tea	3	--	--	--	
3.	T_5 (Marie Van Houtte?), Tea	1	1	--	--	
4.	T_7 (Celine Forestier?), Noisette	3	--	--	--	
5.	Bharani, Polyantha	4	--	--	--	
6.	Little Darling, Floribunda	28	23	150	4	Not yet flowered
7.	Julien Potin, Hybrid Tea	1	--	--	--	
8.	Queen Elizabeth, Hybrid Tea	2	2	10	--	
9.	Rosy Mantle, Climbing Hybrid Tea	26	22	6	Still to germinate	
10.	Lovers' Meeting, Hybrid Tea	1	--	--	--	
11.	Self of (R. Clinophylla x R. Bracteata) B	12	3	12	5	Large variation in size/rate of growth F_1 plants

As regards *R. bracteata*, intercrossing with the Teas, only six germinations were recorded in cross (T, Mrs.B.R. Cant? x *R. bracteata*) of which one dwarf repeat flowering seedling has survived, which should be useful for further work. A Clinophylla crossed into tetraploids listed above has not yielded any resulkis. Bu. there is one dwarf Floribunda type seedling resulting from the cross (Little Darling x *R. bracteata*) with cream single flowers.

The only real success of the breeding programme is the raising of seedlings from the cross (*R. clinophylla* x *R. bracteata*). Of these seedlings five were treated at the first true leaf stage with 0.1% aqueous solution of colchicine, with the hope of inducing tetraploids. Two different treatments were adopted - 4) immersion of the entire seedling (excepting for the root) in 0.1% colchicine for & hours, and b) weatment of the growing tip with 0.1% colchicine, 3 times daily for one week.

Two seedlings, identified as (Clinophylla x Bracteata) B and (Clinophylla x Bracteata) C have survived these treatments arising from the adoption of methods (a) and (b) respectively.

Of these, (Clinophylla x Bracteata) B has shown exceptional growth and freedom of flowering. Judged by appearances, this is very close to *R. bracteata*, the pollen parent. Several crosses have been made using this as pollen parent. as shown in Table Ili, The choice of teraploid seed parents was based on the assumption that the seedling was a tetraploid. Sub sequent investigations by Sambandamurthy et al of Tamil Nadu Agricultural University[11] showed however that this is a diploid with 14 chromosomes.

As is evident from Table III, the cross, tetraploid garden rose x Clinophylla x Bracteata is also one which is difficult to achieve. However. four seedlings from the cross (Little Darling x (Clinophylla x Bracteata B) have survived but are yet to flower after one growing season. Judged by appearance, they are much closer to Little Darling, the tetraploid parent, which is obviously what should be expected. Five self seedlings of (Clinophylla x Bracteata) B have also been raised, which would hopefully be more fertile than the parent, As using *R. clinophylla/R. bracteata* as pollen parents proved to be of little use, using them as seed parents was tried for the first time during 1989. The pollen parents used were the polyanthas, Perle d'Or, Cecile Brunner, as well as certain Hybrid Teas/Floribundas viz., Montezuma, Royal Gold, Fidelio, etc. A considerable quantity of seed has been harvested with the crossess of *R. clinophylla* and *R. bracteata* with Perle d'Or/Cecile Brunner. Germination has not yet commenced – October 1990. But there is yet time. Preliminary indications seem to be that using *R. clinophylla/R. bracteata* as seed parents would be more fruitful.

Before closing this account of work done with *R. clinophylla/R. bracteata* we venture on the following general points, which, hopefully, would be of use to other rose breeders. Clearly, *R. clinophylia* is genetically very distant from modem roses. There is also the problem of its being a diploid, whereas modern roses are generally tetraploid.

Additionally. *R. clinophylla* is, under Kodaikanal conditions, highly susceptible to both mildew end black spot. Unlike its close relative, *R. bracteata*, which, as mentioned earlier, is almost immune. The seedling (Clinophylla x Bracteata) B is also susceptible ta mildew/black spot. though much healthier then *R. clinophyila* itself.

According to the work done by Dr. A. V. Roberts et al[12], there would appear to be two different types of resistances to infection by black spot. The first type, based on cuticular resistance, and the second type, chemically based. According to these authors, 'from the breeder's point of view, a type of resistance is needed which reappears in at least a proportion of the progeny in undimished strength. Such might be the case where resistance is conferred by a chemical that is controlled by a small number of genes.'

While we do hope that the resistance of *R. bracteata* is due to genetically controlled chemical factors, visual impressions (which may be quite wrong) appear to indicate that the resistance is of cuticular origin.

One other problem in breeding with *R. clinophylla* arises from the thin petal texture of the flowers, no doubt due, partly at least, to the diploid chromsome number. Petal texture is a factor of great importance when breeding roses for warm climates and hopefully, this problem could be overcome if tetraploid progeny with the genes of *R. clinophylla* could be evolved by selective breeding.

We may mention in passing that datailed studies on the relation between corolla thickness and parentage of roses of the type done for rhododendrons by Pat Halllgan[13] would be very useful indeed for rose breeders.

Breeding with *R. clinophylla* apart, we require a general strategy for rose breeding for the tropics. Here, the answer would be to concentrate on breeding roses whih are evergreen as distinct from deciduous. We may observe that the deciduous characteristic has incidentally been encouraged by temperate climate rose breeding with an emphasis on winter hardiness. But in the tropics the situation is entirely different, and breeding an evergreen rose is well within the realms of possibility. It is of interest to note that some of the evergreen rose specios e.g. *R. bracteata* itself, *R. laevigata, R. sempervirens*, have some of the most beautiful rose foliage imaginable. As far back as 1854, the well known English rosarian, Thomas Rivers, writing about *R. bracteata* and its good qualities, said he hoped that utimately gardeners would not be satisfied unless all roses had evergreen foliage brilliant and fragrant flowers, and along season of flowering. This might seem, he said an extravagant anticipation, but perseverance in breeding would yet achieve wonders[14].

In more modern times, authorities such as Stelvio Coggliati[15] and Sam McGrady[16] have emphasized the need for beautiful rose foliage; in other words, evergreen foliage. McGredy has this to say - "Plant qualities are going to be important in the future. We tend to look on roses at present as something to fill a bed with colour for a few months, of the year. But I think that roses - or some roses - are going to become garden plants of beauty whether the blooms are on them or not".

Table: IV

HYBRIDES OF EVERGREEN ROSE SPECIES

S. No.	Evergreen Species	Hybrid Variety	Parentage	Remarks
1.	R. BRACTEATA	MERMAID	R. BRACTEATA x YELLOW TEA ROSE	Rampant everblooming climber with beautiful foliage and single cream flowers.
2.	R. BRACTEATA/ R. LAEVIGATA	MARIE LEONIDA	R. BRACTEATA x LAEVIGATA	Climber with large full cupped, yellowish, white flowers, glossy foliage.
3.	R. LAEVIGATA	SINICA ANEMONE	R. LAEVIGATA x TEA ROSE	Climber with clear pink single flowers.
4.	R. LAEVIGATA/ R. WICHURIANA	SILVER MOON	R. WICHURIANA x DEVONIENSIS	Large pale yellow flowers, semi double, on strong stems, foliage dark, leathery, glossy.
5.	R. SEMPERVIRENS	ADÉLAÏDE D'ORLÉANS	R. SEMPERVIRENS x Unknown	Climber with semi double pale pink flowers.
6.	R. SEMPERVIRENS	BONICA (MEIdomonac)	(R. SEMPERVIRENS x MARTHE CARRON) x PICASSO	Shrub rose. Pink flowers, AARS 1982. Marthe Carron is pure *R. wichuriana*
7.	R. BANKSIAE/ R. LAEVIGATA	FORTUNIANA	R. BANKSIAE x R. LAEVIGATA	Double white climber. Widely used as rootstock.
8.	R. BANKSIAE	PUREZZA	TOM THUMB x R. BANKSIAE	White climber with profuse clusters.
9.	R. CLINOPHYILA	LUCIDA DUPLEX	SPORT OR SEEDLING OF R. CLINOPHYILA	Large double flower of white with rosy flush. Described by William Paul in "The Rose Garden" 1848.

While such thinking may appear novel, as for as roses go, the importance of foliage has long been recognised in other garden plants e.g. rhododendrons, where evergreen foliage and the capacity of the plant to hold foliage in good condition for several years has long been prized e.g. the article “Forget the flowers, breed for leaves” by Dr. M. J. Harvey[17].

The romantic, indeed alluring, prospect of roses with brilliant evergreen foliage would appear to be well within the realms of practical possibility. Among the various rose species the following are evergreen or nearly so - *R. clinophylla, R. bracteata, R. sempervirens, R. banksia, R. laevigata, R. wichuriana.* All of them, apart from beautiful evergreen foliage, share one very important characteristic-viz., of being specias native to the warmer portions of the world. The link between evergreen foliage and warm climate is hopefully very close indeed, and should be a source of inspiration for future rose breeders of the topics. Several hybrids have already been raised using various evergreen species (see Table IV which gives an illustrative list) but, as could be expected, evergreen foliage was not the main object with which the crosses were made. This facinatings ,,,,,,,,,,,,,,,prospect is left to the rose breeders of the future.

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ROSE BREEDING FOR THE TROPICS

M. S. Viraraghavan

Producing better roses for India and other tropical regions is indeed a challenging task. In addition to the normal difficulties of any plant breeding programme, warm climate rose breeding carries with it the daunting implication of having to deliberately reverse the conscious process of selection for resistance to cold, or winter hardiness, which has been basis of Western rose breeding for well over 100 years.

Broadly speaking, two approaches are feasible :

1. Evolving a strain of heat resistant roses starting with standard modern roses e.g. Montezuma, or heritage roses e.g. Gruss an Teplitz, with good performance in warm climates.

2. Breeding with tropical rose species, Rose Clinophylla (Rose Involucrata)[2] and its near relative, Rosa Bracteata.

In this paper an attempt is made, in summary form, to set out the results achieved by adoption of these two alternate strategies of rose breeding in the light of work done, and observations made by various Indian rose breeders including the work done by the author from 1966 onwards.

A disclaimer or a plea for anticipatory bail would be in order, before we begin this article which, while striving for scientific accuracy to the extent information is available is unashamedly from the point of view of the practical horticulturist. As such inclusion of a certain amount of material based on intuition or 'feel' has become inevitable. In fact, without this element, it is difficult to do justice to the subject of rose breeding. May I add that this is not just the author's view - that the mechanics of rose breeding are easy enough, but that the flair for the right cross

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is not so - but is one well supported by various well known authorities e.g. Sanday[3].

One other important factor, which has to be taken note of is the great variation in climate which exists within the tropics, and, for that matter, within India itself. One authority, Sunil Jolly, has divided India into 10 agroclimatic zones for growing roses, and, in the ultimate analysis, separate breeding lines would be required for each of these 8 zones : 4.5.

While on the subject of breeding tropical roses, adopting strategy 1, viz. working with standard/heritage varieties, which have performed well in the Indian climate, it is appropriate to begin with the work of Sri. P. Bhatcharji. Apart from being probably the first Indian rose breeder to recognise the need to create a separate line of heat resistant roses, Sri. Bhatcharji has the distinction of putting his theories into practical application by raising a large number of roses which were very well adapted to the agroclimate he was working in. Unfortunately not much information is available on the parentages of the roses raised by Sri. P. Bhatcharji; but it would appear that several of the hardy Hybrid Perpetuals, as well as varieties like the China polyantha rose, Cecile Brunner, other China/polyantha roses, and some tea roses, were utilized; e.g. his varieties Muktadara (satin pink Floribunda) and Toohin (white Floribunda) appear to be derived from Cecile Brunner, while his apricot Hybrid Tea' Raja Ram Mohan Roy appears to be linked with the Tea roses.

A serious effort to create such a line was initiated by the author from 1966 onwards. Among the varieties so chosen for the work were the China/polyantha rose, Cecile Brunner, several of the Tea roses such as Catherine Mermet, Madame Falcot, and Etoile de Lyon, all of which are diploid. Other choices were the Bourbon rose, Rose Edward, and the Hybrid Musk, Prosperity, both of which are triploid, and the Hybrid Tea (Bourbon ?) Gruss en Teplitz, which is a tetraploid. These varieties were intercrossed with a wide variety of garden roses, ranging from polyantha/miniatures, to standard large flowered Hybrid Teas/Floribundas, as also some climbers.

Table 1 sets out the work done on some of these varieties viz. Cecile Brunner and Catherine Mermet (diploid), R. Edward (triploid), and Gruss en Teplitz (tetraploid).

As is evident from the table, work with Cecile Brunner resulted in almost complete failure, except for the solitary pair of seedlings with the polyantha, The Fairy. By hindsight it is quite evident that such a result should have been expected when crossing a diploid rose with mainly tetraploid garden roses. But there is yet scope to utilize Cecile Brunner, which, as many would confirm, is indeed very well adapted to different regions of India, in work with R. Clinophylla, which is dealt with later. From (Catherine Mermet (?) x Samba), came the dwarf red Floribunda, First Offering.

Again, work with R. Edward did not lead to any tangible results. Nor did crosses with Prosperity - results which also could have been forecast, since triploid roses are inherently difficult to work with.

Fortunately, work with Gruss en Teplitz was much more rewarding and the author's lilac Hybrid Tea, Vanamali, the dark Pink Hybrid Tea, Kanchi, the pink Floribunda, Amrapali, are all derived from this line. In the next generation from Gruss en Teplitz has appeared the red Grandiflora, Achanta, from a cross with Kanchi.

Other rose breeders have also achieved some results using Gruss en Teplitz; e.g. Dr. Pal's Rose Sherbet, the Floribunda, Rosemary Rose, from which is derived the very popular red Floribunda Europeana (de Ruiter).

Another angle to the raising of heat resistant roses is the utilization of standard modern varieties of the type of Montezuma (well adapted to almost all the climates in India), Garden Party (at its best in cool, dry regions), Maria Callas (well adapted throughout India), and others too numerous to mention, specifically adapted for various agroclimatic zones.

One of the early successes using Montezuma was the author's Kanyakumari a repeat flowering climber in the salmon

TABLE : I

Results of Hybridisation with Cecile Brunner, Catherine Mermet, Rose Edward, & Gruss En Teplitz, 1966-1969

S.No.	Seed Parent	Pollen Parents	No. of Crosses	Hips Harvested	Seedlings Germinated	Remarks
1.	CECILE BRUNNER (polyantha)	(Illustrative List) POLYANTHAS 1. Mr. BLUE BIRD 2. THE FAIRY	213	45	5	Work done at Nizamabad (Deccan Plateau) and Madras (East Coast), only 2 seedlings from the cross (Cecile Brunner x The Fairy) found useful for further work.
		HYBRID TEAS				
2.	CATHERINE MERMET(?) (Tea)	1. KING'S RANSOM 2. TAPESTRY 3. INDEPENDENCE	125	51	10	Work done at Nizamabad (Deccan Plateau). One seedling (Catherine Mermet (?) x Samba) was introduced as a red Floribunda. "FIRST OFFERING".
		FLORIBUNDAS				
3.	R EDWARD (Bourbon)	1. LILAC CHARM 2. EUROPEANA	335	40	43	Work done at Nizamabad (Deccan Plateau), Madras (East Coast) and Hyderabad (Deccan Plateau) seedlings generally very inferior, excepting for a cross (R.Edward & Golden Showers) from which 3 fragrant seedlings emerged.
4.	GRUSS EN TEPLITZ (Hybrid Tea/Bourbon)		305	88	Details misplaced	Work done at Madras (East Coast). from these crosses crosse KANCHI (dark pink Hybrid Tea), and in a later generation, VANAMALI (lilac hybrid Tea) and AMRAPALI (Pink Floribunda).

pink range of colour. Further work with Montezuma Maria Callas suffered a setback on account of the shift to Kodaikanal in 1980 from Hyderabad, where these varieties do not perform well. But there is little doubt that such an approach would be of great value and results could be achieved much more easily than when working with the heritage varieties.

As regards heritage varieties, we should observe that, apart from problems caused by diploid/triplo id chromosome number, these varieties, in general, do not possess disease resistance as such. They appear to owe their longevity, under Indian conditions, more to disease tolerance, and the ability to recover from severe infection without special care or protective spraying. Varieties such as R. Edward and Cecile Brunner, though hardy, are exceedingly susceptible to mildew and this fault is much more pronounced in further generations raised from them.

Unfortunately, the same is true, by and large, of the Tea roses, which combine a moderate resistance to Black Spot with a great susceptibility to mildew (under Hyderabad conditions).

In passing, we should mention that the results with the heritage varieties appear a little more discouraging then perhaps might be the case, if it had been possible to do the work on a sustained basis in the same agroclimatic zone.

Coming to strategy II, i.e. hybridization with the tropical rose species, R. Clinophylla (R. Involucrata), possibilities in this direction have been pointed out by E.F. Allen[1]. But we cannot resist mentioning that the author's attempt ten years earlier in 1967 - to obtain plants of R. Clinophylla from the Botanical Survey of India, Sibpur, ended in failure, as R. Multiflora was sent from the gardens labelled as 'R'Clinophylla', and, ignorance compounded by a belief in the Infallibility of the Botanical Survey of India led to several years being wasted before the mistake was discovered.

The strategy advised by Allen was to intercross R. Clinophylla with varieties of the type of Tea/Noisette, Lamarque, which does well in many parts of the tropics. Allen observes that as is normally the case, the F_2 generation between a species and a continuous flowering hybrid is likely to be once flowering, but this could be overcome in subsequent generations, raised by selfing or backcrossing to Lamarque, to yield recurrent, flowering climbers. According to him, a further generation raised by crossing such recurrent flowering climbers with fertile diploids would yield dwarf bedding roses suitable to the tropical climate.

The final step would be to cross the resultant diploid hybrids with selected standard tetraploid garden roses, which would yield initially, triploids of low fertility, but eventually tetraploids would arise by much the same process through which they have evolved in temperate regions, among Hybrid Teas and Floribundas.

Before taking up an analysis of the results achieved with R. Clinophylla, it would be useful to briefly describe the features of this species and its distribution in India.

The species is described by Dr. Pal in his well known book, 'The Rose in India' as a 'stout, erect or semi-climbing shrub, flowers white, single, borne singly or in clusters, fruits roundish, hairy and pale. Distribution throughout India, especially in the plains of Bengal'[6]. 'The foliage is light green, deeply veined with 5-7 leaflets with an apex leaflet considerably elongated, oblong lanceolate in shape. The curious involucras i.e. groups of bracts enveloping the young inflorascences are another feature by which the species can be easily recognised'

According the classification adopted by Darlington, it is the only other member of the subgenus[8]. Bracteatae, of the genus Rosa, the other member being R. Bracteata, native of South China and Upper Burma. Even from the horticulturist's point of view, the close resemblance between the two species is strikingly obvious. Under Kodaikanal conditions R. Bracteata is, by far, the superior plant, possessing as it does, two very interesting, indeed, unique features :

1. Virtual immunity to mildew/black spot
2. Capacity to flower continuously.

As such, work on R. Bracteata has been carried on simultaneously with that on R. Clinophylla, with the expectation that the progeny would be easily intercrossable and the superior qualities of R. Bracteata incorporated in the strain from the beginning itself.

Work started in 1985 with a clone of R. Clinophylla, collected in the wild near Ranchi, Bihar State. Other clones have been reported from the Farakka Barrage area in West Bengal[9] and from the Mount Abu area in Rajasthan[10].

In the initial years the work was carried on using R. Clinophylla and R. Bracteata as pollen parents, following the recommendations of E.F. Allen[2], that the cross, (cultivar x speices) is more likely to succeed rather than the reverse. The seed parents employed included eight varieties of Tea and Noisettle roses, provisionally identified as Marie van Houtte, Jean Ducher, Mrs. B. R. Cant (3 forms), Bouquet d'or, Safrano, Lamarque, Celine Forestier, Marechal Neil; the polyanthas, Cecile Brunner Perle d'Or, Baby Farraux and Gloria Mundi; as well as certain Floribundas/Hybrid Teas which are exceptionally fertile under Kodaikanal conditions viz., Little Darling, Queen Elizabeth, Independence, Lover's Meeting and Julien Potin.

It can be seen that the first group are diploids, as is R.Clinophylla, and the second group are all tetraploids. The results achieved are available in Table II.

An analysis of Table II clearly indicates that under Kodaikanal conditions utilizing R. Clinophylla and R. Bracteta as pollen parents, is not likely to yield tangible results. The crosses of R.Clinophylla and R.Bracteata with polyanthas have been uniformly a failure. As regards crosses with Teas, only three seedlings have been raised with R.Clinophylla of which two (T_5 Marie van Houtte ? x R.Clinophylla) and (T_4 Mrs. B. R. Cant ? x R.Clinophylla) have not yet flowered, even in the third season after germination. Seedling No. 3 (T_4 Mrs. B. R. Cant ? x R.Clinophylla) appears more promising as it is dwarf and has flowered twice with single white flowers of the type of R. Clinophylla in the first season after germination.

TABLE IIa

CROSSES WITH R. CLINOPHYLLA AS POLLEN PARENT : 1985-1989

S.No.	Seed Parents	No. of Crosses	Hips	Seed	Seedlings	Remarks
1.	T_1 (Madame Hoste? Tea	5	—	—	—	
2.	T_2 (Boquet d'Or ?) Tea	9	—	—	—	
3.	T_3 (Safrano?) Tea	14	13	6	—	
4.	T_4 (Mrs. B. R. Cant) Tea	23	17	27	2	of the 2, one has flowered (see text)
5.	T_5 (Marie Van Houtte?) Tea	16	4	13	1	
6.	T_6 (Jean Ducher?) Tea	8	1	5	—	
7.	T_7 (Celine Forestier?) Tea	6	—	—	—	
8.	Lamarque Noisette	26	20	—	—	
9.	Marechal Neil Noisette	2	—	—	—	
10.	Cecile Brunner Polyantha	28	11	—	—	
11.	Perle d'or Polyantha	30	10	—	—	
12.	Gloria Mundi Polyantha	7	7	1	—	Too early. Germination may occur.
13.	Echo Polyantha	4	—	—	—	
14.	Gold Topas Floribunda	2	—	—	—	
15.	Little Darling Floribunda	10	6	20	—	
16.	Independence Hybrid Tea	7	5	8	—	
17.	Queen Elizabeth Hybrid Tea	4	4	6	—	

Note : ? Identification provisional

TABLE : II b

Crosses with R.Bracteata As Pollen Parent : 1985-1989

S.No.	Seed Parent	No. of Crosses	Hips	Seed	Seedlings	Remarks
1.	T_1 (Madame Hoste?) Tea	1	—	—	—	
2.	T_2 (Boquet de Or) Tea	4	—	—	—	
3.	T_3 (Safrano?) Tea	8	6	8	—	
4.	T_4 (Mrs. B.R. Cant?) Tea	26	17	47	6	Only 1 survived This is a dwarf single
5.	T_5 (Marie Van Houtte?) Tea	6	3	13	—	
6.	T_6 (Jean Ducher?) Tea	1	—	—	—	
7.	T_7 (Celine Forestier?) Noisette	4	7	—	—	
8.	Marechal Neil Noisette	1	—	—	—	
9.	Lamarque Noisette	15	—	—	—	
10.	Lady Hillingdon Tea	3	3	—	—	
11.	Cecile Brunner Polyantha	2	—	—	—	
12.	Laurette Messimy China	4	—	—	—	
13.	Rise 'n Shine Miniature	8	—	—	—	
14.	O'er The Rainbow, Miniature	5	2	5	—	
15.	Mini Cocktail Miniature Seedling	16	11	1	—	
16.	Little Darling Floribunda	27	22	50+	1	Single, cream coloured flower of floribunda type
17.	Baby Faraux Polyantha	32	9	5	—	
18.	International Herald Tribune Hybrid Tea	3	—	—	—	
19.	R Clinophylla Species	76	70	200+	45	

TABLE III

Crosses with (R.Clinophylla x R. Bracteata) B as Pollen Parent

S.No.	Seed Parent	No. of Crosses	Hips	Seed	Seedings	Remarks
1.	T_3 (Boquet D'Or?). Tea	2	—	—	—	
2.	T_4 (Mrs. B. R. Cant?). Tea	3	—	—	—	
3.	T_6 (Marie Van Houtte?). Tea	1	1	—	—	
4.	T_7 (Celino Forrestier?). Noisette	3	—	—	—	
5.	Bharani. Polyantha	4	—	—	—	
6.	Little Darling. Floribunda	28	23	150+	4	Not yet Flowered
7.	Julien Potin. Hybrid Tea	1	—	—	—	
8.	Queen Elizabeth. Hybrid Tea	2	2	10	—	
9.	Rosy Mantle. Climbing Hybrid Tea	26	22	6	Still to germinate	
10.	Lover's Meeting. Hybrid Tea	1	—	—	—	
11.	Self of (R.Clinophylla R Bracteata) B	12	3	12	5	Large variation in size/rate of growth F_1 plants.

As regards R. Bracteata, intercrossing with the Teas, only six germinations were recorded in cross (T_1 Mrs.B.R. Cant? x R. Bracteata) of which one dwarf repeat flowering seedling has survived, which should be useful for further work. R.Clinophylla crossed into tetraploids listed above has not yielded any results. But there is one dwarf Floribunda type seedling resulting from the cross (Little Darling x R. Bracteata) with cream single flowers.

The only real success of the breeding programme is the raising of seedlings from the cross (R.Clinophylla x R.Bracteata). Of these seedlings five were treated at the first true leaf stage with 0.1% aqueous solution of colchicine, with the hope of inducing tetraploids. Two different treatments were adopted - a) immersion of the entire seedling (excepting for the root) in 0.1% colchicine for 8 hours, and b) treatment of the growing tip with 0.1% colchicine, 3 times daily for one week.

Two seedlings, identified as (Clinophylla x Bracteata) B and (Clinophylla x Bracteata) C have survived these treatments arising from the adoption of methods (a) and (b) respectively.

Of these, (Clinophylla x Bracteata) B has shown exceptional growth and freedom of flowering. Judged by appearances, this is very close to R.Bracteata, the pollen parent. Several crosses have been made using this as pollen parent, as shown in Table III. The choice of teraploid seed parents was based on the assumption that the seedling was a tetraploid. Sub sequent investigations by Sambandamurthy et al of Tamil Nadu Agricultural University[11] showed however that this is a diploid with 14 chromosomes.

As is evident from Table III, the cross, tetraploid garden rose x Clinophylla x Bracteata is also one which is difficult to achieve. However, four seedlings from the cross (Little Darling x (Clinophylla x Bracteata B) have survived but are yet to flower after one growing season. Judged by appearance, they are much closer to Little Darling, the tetraploid parent, which is obviously what should be expected. Five self seedlings of (Clinophylla x Bracteata) B have also been raised, which would hopefully be more fertile than the parent.

As using R.Clinophylla/R.Bracteata as pollen parents proved to be of little use, using them as seed parents was tried for the first time during 1989. The pollen parents used were the polyanthas, Perle d'Or, Cecile Brunner, as well as certain Hybrid Teas/Floribundas viz., Montezuma, Royal Gold, Fidelio, etc. A considerable quantity of seed has been harvested with the crossess of R.Clinophylla and R.Bracteata with Perle d'Or/Cecile Brunner. Germination has not yet commenced - October 1990. But there is yet time. Preliminary indications seem to be that using R.Clinophylla/R.Bracteata as seed parents would be more fruitful.

Before closing this account of work done with R.Clinophylla/ R. Bracteata we venture on the following general points, which, hopefully, would be of use to other rose breeders. Clearly, R.Clinophylla is genetically very distant from modern roses. There is also the problem of its being a diploid, whereas modern roses are generally tetraploid.

Additionally, R.Clinophylla is, under Kodaikanal conditions, highly susceptible to both mildew and black spot. Unlike its close relative, R.Bracteata, which, as mentioned earlier, is almost immune. The seedling (Clinophylla x Bracteata) B is also susceptible to mildew/black spot, though much healthier then R. Clinophylla itself.

According to the work done by Dr. A. V. Roberts et al [12], there would appear to be two different types of resistances to infection by black spot. The first type, based on cuticular resistance, and the second type, chemically based. According to these authors, 'from the breeder's point of view, a type of resistance is needed which reappears in at least a proportion of the progeny in undimished strength. Such might be the case where resistance is conferred by a chemical that is controlled by a small number of genes.'

While we do hope that the resistance of R. Bracteata is due to genetically controlled chemical factors, visual impressions (which may be quite wrong) appear to indicate that the resistance is of cuticular origin.

One other problem in breeding with R.Clinophylla arises from the thin petal texture of the flowers, no doubt due, partly at least, to the diploid chromsome number. Petal texture is a factor of great importance when breeding roses for warm climates and hopefully, this problem could be overcome if tetraploid progeny with the genes of R. Clinophylla could be evolved by selective breeding.

We may mention in passing that detailed studies on the relation between corolla thickness and parentage of roses of the type done for rhododendrons by Pat Halligan[13] would be very useful indeed for rose breeders.

Breeding with R, Clinophylla apart, we require a general strategy for rose breeding for the tropics. Here, the answer would be to concentrate on breeding roses whih are evergreen as distinct from deciduous. We may observe that the deciduous characteristic has incidentally been encouraged by temperate climate rose breeding with an emphasis on winter hardiness. But in the tropics the situation is entirely different, and breeding an evergreen rose is well within the realms of possibility. It is of interest to note that some of the evergreen rose species e.g.R.Bracteata itself, R.Laevigata, R.Sempervirens, have some of the most beautiful rose foliage imaginable. As far back as 1854, the well known English rosarian, Thomas Rivers, writing about R.Bracteata and its good qualities, said he hoped that utimately gardeners would not be satisfied unless all roses had evergreen foliage, brilliant and fragrant flowers, and a long season of flowering. This might seem, he said an extravagant anticipation, but perseverance in breeding would yet achieve wonders.[14]

In more modern times, authorities such as Stelvio Coggliati[15] and Sam McGrady[16] have emphasized the need for beautiful rose foliage; in other words, evergreen foliage. McGredy has this to say-'Plant qualities are going to be important in the future. We tend to look on roses at present as something to fill a bed with colour for a few months, of the year. But I

TABLE IV

HYBRIDS OF EVERGREEN ROSE SPECIES

S.No.	Evergreen Species	Hybrid Variety	Parentage	Remarks
1.	R BRACTEATA	MERMAID	R. BRACTEATA x YELLOW TEA ROSE	Rampant everblooming climber with beautiful foliage and single cream flowers.
2.	R. BRACTEATA/ R. LAEVIGATA	MARIE LEONIDA	R. BRACTEATA x LAEVIGATA	Climber with large full cupped, yellowish, white flowers glossy foliage.
3.	R. LAEVIGATA	SINACA ANEMONE	R. LAEVIGATA x TEA ROSE	Climber with clear pink single flowers
4.	R. LAEVIGATA/ R. WICHURIANA	SILVER MOON	R. WICHURIANA x DEVONIENRSES	Large Pale yellow flowers, semi double, on strong stems, foliage dark, leathery, glossy.
5.	R SEMPERVIRENS	ADELAIDE DE ORLEANS	R. SEMPERVIRENS x Unknown	Climber with semi double pale pink flowers
6.	R. SEMPERVIRENS	BONICA (Mei do monac)	(R. SEMPERVIRENS x MARTHE CARRON) x PICASSO	Shrub rose Pink flowers AARS 1982. Marthe Carron is pure R. Wichuriana.
7.	R. BANKSIAE/ R. LAEVIGATA	FORTUNIANA	R.BANKS AE x R. LAEVIGATA	Double white climber Widely used as rootstock
8.	R. BANKSIAE	PUREZZA	TOM THUMB x R. BANKSIAE	White climber with profuse clusters.
8.	R. CLINOPHYLLA	LUCINDA DUPLEX	SPORT OR SEEDLING OF R. CLINOPHYLLA	Large double flower of white with rosy flush. Described by William Paul in "The Rose Garden" 1848.

think that roses - or some roses - are going to become garden plants of beauty whether the blooms are on them or not'.

While such thinking may appear novel, as for as roses go, the importance of foliage has long been recognised in other garden plants e.g. rhododendrons, where evergreen foliage and the capacity of the plant to hold foliage in good condition for several years has long been prized e.g. the article 'Forget the flowers, breed for leaves' by Dr. M. J. Harvey[17]

The romantic, indeed alluring, prospect of roses with brilliant evergreen foliage would appear to be well within the realms of practical possibility. Among the various rose species the following are evergreen or nearly so - R. Clinophylla, R. Bracteata, R. Sempervirens, R. Banksia, R. Laevigata, R. Wichuriana. All of them, apart from beautiful evergreen foliage, share one very important characteristic-viz., of being specias native to the warmer portions of the world. The link between evergreen foliage and warm climate is hopefully very close indeed, and should be a source of inspiration for future rose breeders of the tropics. Several hybrids have already been raised using various evergreen species (see Table IV which gives an illustrative list) but, as could be expected, evergreen foliage was not the main object with which the crosses were made. This facinatings prospect is left to the rose breeders of the future.

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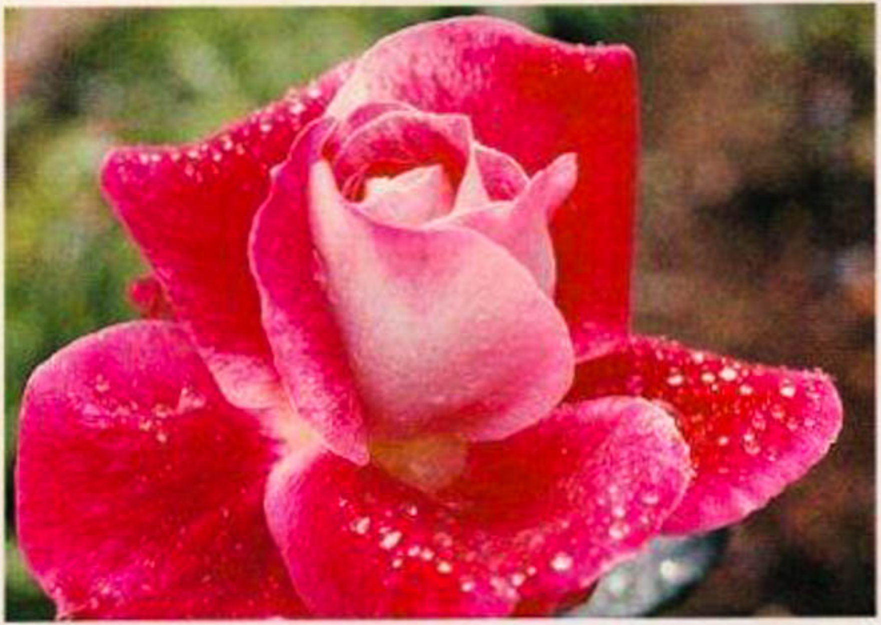

H.T. Seeding of (Pristine × Priyatama) M.S. Viraraghavan.

Indian Rose Annual - IRA 1992

ROSE GROWING ABROAD

M. S. Viraraghavan

During a recent visit abroad we saw several beautiful rose gardens, ranging from very large public gardens to those of champion exhibitors, and I'd like to share some observations with you. Broadly speaking, the observations relate to 2 aspects :

1. Landscaping, and
2. Cultural practices.

Of course, what follows is essentially highly subjective, being a very personal reaction.

Landscaping

If one is to sum up what basically is different about landscaping abroad, I would say it is a relaxed informality of approach where roses are not rigidly planted in beds with military precision, but are mainly the dominant theme supplemented by diverse other features. The latter could be groupings with other plants or various architectural features (not painted), and the skilful use of open vistas, enclosed areas as well as water. It is as though the Queen of flowers, like other modern queens, mingles with the commoners in order to remain popular.

Quite sometime back, the way to make an effective rose garden was demonstrated by Dr. B. P. Pal, when he made a feature of standard roses underplanted with blue pansies. In a similar way, we found that in many

Western gardens, roses, even the H.T's were cheerfully mixed with a variety of small growing annuals and perennials, e.g. campanulas (bell flowers) begoninas and various other dwarf plants.

Generally, 2 objectives were realized by this kind of grouping ---

a. setting off the beauty of roses by mixing them with other plants of contrasting foliage, flowers and colours, and growth habit, and

b. prolonging the season where the rose garden is full of flowers while seeking to fill up gaps, when roses are not in bloom, by timing the other plants to flower in those periods.

Some of these ideas were presented very effectively in the garden of a well known exhibitor, Mr. William Soltis, where another landscaping principle was also very well demonstrated - the need to plant roses closely. Though the Soltis garden is located in the warm climate of Norfolk, Virginia (U.S.A.), where temperatures cross 100^{C}F with regularity in summer, yet close planting was the rule, with plants 1.5 feet apart, in informally shaped beds, edged with miniature roses. Paths were skilfully laid surrounding the beds, and the whole garden, which could not have been more than 500 sq. yds, was surrounded by hedges of roses, with a little stream and a bridge in Japanese style in one corner. On one side of the paths were the rose beds, and on the other groupings of various other plants, strongly influenced by the fact that Mrs. Soltis is from Japan. Camellias, azaleas ferns etc. formed the groupings.

In the bigger gardens, great care was taken about the arrangements of varieties, as well as making sure that the beds contained large numbers of the same variety, especially beds of H.T's and Floribundas so that the somewhat spotty colour effect of rose varieties planted in one's and two's was avoided. Of course, where roses differed considerably in habit of growth and other features, e.g. shrub roses, landscaping effectiveness was achieved by mixing up other shrubs with contrasting leaf form and colour.

Again, talking of bigger gardens, very imaginative use made of features like pergolas and trellises covered with climbing roses, but invariably great care was taken to mix up varieties so that they flowered at different times, and with the companion plantings which could range from dwarf plants at the base of the pergola to other climbers - e.g., clematis with widely different appearance. A particularly charming example was the training of roses on catenaries, i.e. posts at regular intervals, joined by thick loops of rope with climbing roses trained up the posts and along the ropes, in the Queen Mary's Rose Garden in Regent's Park, London, where they formed the enclosure for the rose garden. In The Royal National Rose Garden (R.N.R.S.) at St. Albans, there was a very nice sunken garden with miniatures and other short growing rose varieties, mixed with other plants.

In the garden of Dr. Lind in New York, we saw a lovely example of a rock garden making use of miniatures, and in the Norfolk Botanical Garden, an artistic spiral in which miniatures were displayed, as well as a raised embankment, planted with roses, which also served as a viewpoint from which one could oversee the entire rose garden.

Everywhere, skilful use was made of water features, e.g. the charming small lake in Queen Mary's Rose Garden, and quite differently, by fountains in Longwood Gardens in the U.S. In the R.N.R.S., there was a delightful pool, the surroundings planted thoughtfully so as to enhance the beauty of the roses. Great care was taken to intermingle open vistas with enclosed areas, the feeling of enclosure being achieved either by rose hedges, by suitable trees, by catenaries and in Longwood Gardens, by a combination of topiary and wall.

To conclude this section I can do no better than to quote from what Michael Gibson, former President of R.N.R.S. says in the little booklet 'Gardens of the Rose', as this reflects the direction of the new trend in landscaping rose gardens abroad. 'We were not taking advantage of the many other plants that consort well with roses, and greatly enhance them making a much more complete and satisfying garden picture Now, in cooperation with other specialist plant societies, most of which have no display gardens of their own, we are gradually, most of which have no display gardens of their own, we are gradually putting this right; our long term aim is to extend considerably our present 5 month opening period which coincides of course with the period when roses are in bloom and to create a garden for all seasons, though one in which the rose always plays the dominant role."

Clearly, under Indian conditions, there is considerable scope for improvisation and imaginative planting of rose gardens, especially with several new gardens being planned for the forthcoming World Rose Convention in 1994.

Cultural Practices

One aspect which immediately attracts attention is the extensive use of mulches in the rose beds with various organic and inorganic materials ranging from garden compost to chipped bark and plastic. In the R.N.R.S. garden experiments were in progress for the use of the following as mulches: rotted manure, dead leaves, grass clippings, chopped garden waste, sedge peat, black plastic, fruit of the earth, prime mulch (both proprietary products), King size nuggets, horticultural fibre, forest bark, and chipped bark.

In contrast, very little use of mulch is made in India, when actually it becomes all the more important in our warm climate, both as a means of moisture retention, and as weed control. One feature that should be mentioned is that the mulch has to be laid on quite thick, at least 3" deep, to be effective.

Clearly, rose growers abroad believe in strictly following rotation of areas under roses, in order to avoid problems of soil sickness. Two interesting examples come to mind. The R.N.R.S grounds and the Harkness Nursery. In the R.N.R.S., the area set apart for the trials is much larger than seems necessary - almost the size of a football field - with only a small portion actually planted with roses under trial, so that there is scope for continuing the next batch of planting in an entirely different area every year. At the Harkness Nursery, Mr. Peter Harkness told me that every year they take 10-15 acres of land on lease in different blocks to raise that year's crop of roses in fresh soil.

Regarding fertilization, there was great emphasis on continuous feeding during the growing season in order to ensure that the roses had optimum quantities of nutrients all the time while avoiding the pitfalls of excess/shortage of nutrients at different stages of growth. This was achieved by either of 2 approaches, the first being the use of slow release fertilizers of the type of Osmocote, which is N.P.K. coated with a polymer to ensure that the nutrients are released over a period of time to cover the growing season, and not all at once. One application of such a slow release fertilizer is enough for the entire season. An altogether different approach was that of ace exhibitor, Dr. Thomas Cairns, who incidentally won several prizes in the R.N.R.S. Show in England with flowers from California, where he lives. He feeds his roses every week in the growing season with the following :

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3rd week : Organic fertilizer e.g fish emulsion
4th week : High nitrogen

Repeat throughout the growing season.

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As everywhere else in the world, there is a movement away from the purely inorganic (fertilizer) approach to the problem of manuring plants. One interesting example was the 'fragrant formula' of Howard Walters, Past President of the American Rose Society who swears by the formula, consisting of the following: "

3 ample yards of compost materials or leaves
100 pounds of coarse organic stuff like ground pine bark or cottonseed hulls
100 pounds of cottonseed meal
100 pounds of alfalfa meal
50 pounds of bonemeal
50 pounds of fish meal

If fish meal is not available, substitute a couple of sacks of manure and may be add 20 pounds of bloodmeal or beef and bone. There are lots of variations that will work.

The Digestion Process.... Make a pile of the coarse materials in any area suitable for composting, maybe an old flower bed. Add the lighter ingredients a little at a time and turn with a pitchfork. Mix well. Then moisten LIGHTLY and turn with a fork twice a week for 2 weeks.

A sharp ammonia odour will escape if the pile is working properly. A DIFFERENT (dead) odour will leak if the mix is too wet or if there is not enough coarse material. The Fragrant Formula is ready in about 3 weeks. WARNING: The pile will turn into a slime if allowed to get too wet during the digestion process. Use about 2 garden shovelsful per established plant for the 1st feeding in the spring. One shovelful can be used as a supplement in summer. If the soil is acid skip the cottonseed meal and substitute compost. These organics in the spring will make other fertilizers work better, feeding the micro-organisms that do all the work converting soil nutrients into forms roses can use. With the Fragrant Formula you'll have live soil, healthy organisms and lots of roses. Use generously. It really works."

In India we will have to modify it using materials locally ivailable, but the principle remains the same.

On pesticide application, the emphasis is on safety, with the increased concern on environmental damage caused by excessive use of pesticides, as well as the risk to the gardener himself because of exposure to toxic sprays. Safety precaution when applying pesticides are stringently adhered to wearing of gloves and masks. There is also continuous review by the environmental protection agencies to eliminate hazardous pesticides.

Contrary to the general impression we have in India, water scarcity is also something to be contended with, even in England these days, and more so in the U.S. So watering schedules are very carefully worked out and various devices used to reduce water requirement eg. mulches, as also the use of water absorbent soil polymers, both for roses in the ground and in containers.

Finally, the overall impression is that every effort is made in Western rose gardens to emphasize the diversity available in the rose family. Very rarely are rose gardens, even the smallest ones, confined to just H.T's, and everywhere there is abundant use of other kinds of roses, including the newly developed ground covers (in larger gardens) and patio and climbing miniatures (in smaller gardens). Some of the popular ground cover roses are 'Grouse, 'Pheasant', etc. (named after various game birds) and 'County' series - 'Surrey', 'Suffolk' etc. Among the climbing miniatures, a group of Red Cascades is impressed on my memory, and there is much interest in roses like Nozomi, as well as the new miniature climbers bred by amateur Chris Warner - Laura Ford, yellow, and Warm Welcome, orange.

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Hillview, Fernhill Road, Kodaikanal 624 101, Tamil Nadu.

RNRS Trial Ground 12th Sept. 1991

"Tombola" RNRS Gardens, St. Albans 12th Sept. 1991

"Savoy Hotel" Queen Mary's Garden Regents Park
13th Sept. 1991

Pond in Queen Mary's Garden
Regent's Park, London 13th Sept. 1991

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If fish meal is not available, substitute a couple of sacks of manure and may be add 20 pounds of bloodmeal or beef and bone. There are lots of variations that will work.

The Digestion Process.... Make a pile of the coarse materials in any area suitable for composting, maybe an old flower bed. Add the lighter ingredients a little at a time and turn with a pitchfork. Mix well. Then moisten LIGHTLY and turn with a fork twice a week for 2 weeks.

A sharp ammonia odour will escape if the pile is working properly. A DIFFERENT (dead) odour will leak if the mix is too wet or if there is not enough coarse material. The Fragrant Formula is ready in about 3 weeks. WARNING: The pile will turn into a slime if allowed to get too wet during the digestion process. Use about 2 garden shovelsful per established plant for the 1st feeding in the spring. One shovelful can be used as a supplement in summer. If the soil is acid skip the cottonseed meal and substitute compost. These organics in the spring will make other fertilizers work better, feeding the micro-organisms that do all the work converting soil nutrients into forms roses can use. With the Fragrant Formula you'll have live soil, healthy organisms and lots of roses. Use generously. It really works."

In India we will have to modify it using materials locally available, but the principle remains the same.

On pesticide application, the emphasis is on safety, with the increased concern on environmental damage caused by excessive use of pesticides, as well as the risk to the gardener himself because of exposure to toxic sprays. Safety precautions when applying pesticides are stringently adhered to - wearing of gloves and masks. There is also continuous review by the environmental protection agencies to eliminate hazardous pesticides.

Contrary to the general impression we have in India, water scarcity is also something to be contended with, even in England these days, and more so in the U.S. So watering schedules are very carefully worked out and various devices used to reduce water requirement eg. mulches, as also the use of water absorbent soil polymers, both for roses in the ground and in containers.

Finally, the overall impression is that every effort is made in Western rose gardens to emphasize the diversity available in the rose family. Very rarely are rose gardens, even the smallest ones, confined to just H.T's, and everywhere there is abundant use of other kinds of roses, including the newly developed ground covers (in larger gardens) and patio and climbing miniatures (in smaller gardens). Some of the popular ground cover roses are 'Grouse' 'Pheasant', etc. (named after various game birds) and 'County' series - 'Surrey', 'Suffolk' etc. Among the climbing miniatures, a group of Red Cascades is impressed on my memory, and there is much interest in roses like Nozomi, as well as the new miniature climbers bred by amateur Chris Warner - Laura Ford, yellow, and Warm Welcome, orange.

Indian Rose Annual - IRA 1993

A Search for Rosa Clinophylla

M. S. Viraraghavan

In a very interesting chapter in his classic book 'Climbing for Old and New', the well known English rosarian and horticulturist, Graham Stuart Thomas, has dealt, in intriguing detail, with what he calls 'the mystery of the musk rose' (*Rosa moschata*). Judged by what various authorities have to say, *Rosa clinophylla* (*R. involucrata*) seems to be an even more mysterious creature. The distinctive characteristics of the species seem to vary considerably, as also the locations where it can be found, which lie scattered all over India, with no apparent logical connection to each other.

Sir George Watt, who was the Surveyor General of India in the last two decades of the 20th century, and was in addition a very keen botanist, has made these observations in an unpublished diary of his explorations in Manipur during 1882[1]. Rosa involucrata is "common along the sandy margins of rivers which traverse the valley of Manipur proper, especially around the city …., the Indian distribution of this rose is somewhat remarkable'. In his Himalayan Journal, Sir J. D. Hooker points out its extraordinary occurrence in the jungles of eastern Bengal, interrmixed with palms and other tropical plants and thus living on alluvial soils. "Some years ago I came upon it in great profusion within the valleys of the Rajmahal Hills", (a hill range in Bihar, located west of Asansol in West Bengal and north of Ranchi) "luxuriating under conditions so very different from those of eastern and northern Bengal that its presence there seemed unaccountable but the dry soil and high temperature of Rajmahal is so different from the inundated swampy plains of Bengal. I suspect that there may be two species at least commonly placed under the present name, the one the swamp loving, the other the dry soil plant. In some respects, the Manipur form is suggestive of a third, that comes near to Rosa Bracteata ".

"The assemblage of wild roses of tropical (or perhaps sub-tropical) India is an important one nevertheless, and Col. D. Prain refers to *R. involucrata* to three varieties (which perhaps meets the case) but to these should be added *R. lyelli*, an even still more mountainous form, their representative in the lower N. W. Himalayas and from thence to Rajputana and South India. Where met with, the plants, usually regarded as *Involucrata*, are plentiful enough, but between one locality and another a gap of many thousands of square miles may interpose over which the plant seems to possess no inclination to spread; e.g. on passing north east from Sylhet" (now in Bangla Desh) "it disappears and on the road from thence via Cachar to Manipur - a distance of over 120 miles in a direct line - it is nowhere met with until the valley of Manipur proper is reached, when, at altitudes of from 2,500 to 4,000 feet, what I have suggested as being possibly the Chinese form in the assemblage is found, not only plentiful but, I might almost say, characteristic. This sudden appearance and disappearance in Eastern Bengal is that which the species everywhere manifests throughout its Indian area ".

From this, the reader can infer that, if there is a mystery about *R. moschata*, the musk rose, there is a much more complex one with *R. clinophylla.*

The distinctions set out by Sir George Watt, in the various forms of *R. clinophylla* have been examined by various taxonomists, with, as could be expected, differing conclusions. One of the more recent papers on the subject is the one by Smt. Chhabi Ghora and G. Panigrahi[a], entitled "Taxomonic delineation within the *R. clinophylla* Complex" published, curiously enough, in The Journal of Japanese Botany, February 1985, where *R. clinophylla* has been divided into two species, *R. clinophylla* proper (with two additional varieties) and *R. lyelli.* In othcr words, according to this paper, *R. clinophylla* in India, is in three forms - *R. clinophylla* itself, *R. clinophylla* var. *parvifolia* (i. e. small leaved form) and *R. clinophylla* var. *glabra* (i.e. hairless form but with larger leaves.) *R. lyelli* is held to be a different species but from a horticulturist's point of view, the main differences are slight indeed, consisting mainly of the thorns pointing downward, as against the slightly upward pointing thorns in the clinophylla group.

But this article is written mainly from the horticulturist's point of view, and I cannot resist the conclusion that all the four forms are horticulturally not too different from each other. However, one very interesting difference between the clinophylla forms and lyelil is that, whereas clinophylla generally produces solitary flowers, lyelli flowers in corymbs. But on the whole, I am inclined to follow Sir J. D. Hooker who observed that he could not distinguish *R. clinophylla* from *R. lyelli*, and, following Hooker, *R. lyelli* is treated as part of the *R. clinophylla* group in this article.

For those of who are interested, I furnish in the Appendix[3] what Ghora and Panigrahi consider to be the salient differences between the two species, but it should be noted that, even these authors consider *R. lyelli* to be a member of the same section, Bracteatae, in Rosa, which, according to them comprises three species - *R. bracteata*, *R. clinophylla* and *R. lyelli*.

While there is a considerable overlap of the areas where these roses occur, broadly speaking, *R. clinophylla* var. *glabra* seems to be the most tropical form (found mainly in Bengal, and adjoining regions at low altitudes), and *R. lyelli* the most mountainous form, found in places such as Dehradun, in the foothills of the Himalayas, Mount Abu (Rajasthan), Coorg (Karnataka) and, possibly, in the northern portion of the Eastern Ghats in the Visakhapatnam District of Andhra Pradesh.

Before concluding this part, I would like to stress that the above two forms are horticulturally the most desirable as they have the largest leaves and flowers.

As Dr. N.C. Sen, the well known rosarian from West Bengal has observed, it will be a great advantage to rose hybridists if the various forms of *R. clinophylla* and *R. lyelli* could be gathered at one place.

With this object in mind I have been trying to locate the various types of the species and grow them in Kodaikanal. The first member of the group which could be obtained was a plant of clinophylla from near Ranchi, collected by Mr. Narender Singh of Ranchi. This is probably *R. clinophylla* var. *parvifolia*.

In the publication 'Threatened Plants of India'[4], published by the Botanical Survey of India (B.S.I.) there is a reference to *R. clinophylla* getting scarce in Mount Abu. On seeing this it occurred to me that priority should be given to collecting this before it disappears. And, as luck would have it, the 1992 Rose Convention was held at Baroda, which is quite near Abu. One more important reason for collecting this variant is that it represents the western most point of the area of distribution of *R. clinophylla* complex in India, situated not too far from the border between Gujarat State and Pakistan.

So a trip to Mount Abu was planned immediately after the Baroda Convention. Earlier we had got in touch with some good friends in the Rajasthan administration and the Forest Department, as well as the B.S.I., Western Circle (headquarters Jodhpur).

Mount Abu lies at a distance of about 150 kms, approximately north of Ahmedabad and is a hill station at an altitude of about 4000 feet, with a highest point, Guru Shikar around 5600'. (Incidentally, the highest point in the plains of India between the Himalayas and the Western Ghats)

Starting from Ahmedabad one morning we reached Mount Abu by afternoon, and straightaway set out to look for *R. clinophylla*. We had the good fortune to be accompanied by some officers of the State Forest Department, as well as the enthusiastic Dr. P. J. Parmar of the B.S.T., author of the Flora of Rajasthan. At first the task seemed very easy, as one of the forest guards said that wild roses were quite common all around Abu-and he knew a place where it could be found, and, in no time we reached this spot - about 20 kms from Abu, but we were in for a disappointment as the plants proved to be just *R. multiflora*, which had apparently been planted by the Forest Dept. at various places on the roadside sometime back.

We slowly retraced our steps and stopped at what we thought were likely places, i.e., by the side of streams and lakes, but we could not find anything even remotely resembling a rose, even after covering a fair amount of ground. So, quite dejected we returned to the Forest Bungalow where we were staying.

The main handicap was that we had no precise information regarding where exactly the rose could be found, unlike our earlier expedition to Ukhrul in Manipur, in search of *R. gigantea* (an account of which appeared in ‘Rose News’ sometime back).

The next morning we again set fourth looking for likely places, going up to the top of Guru Shikar, but not a trace of the rose. Feeling very crestfallen, we returned and, as it happened, one of the forest guards got the bright idea of stopping a villager we passed whom he knew, and asked him about the rose. Roop Singh, the villager, was at first puzzled, because, as we realised, the Hindi language word for 'rose', namely, 'gulab' invariably suggests to the layman, a pink flowered rose, as gulab means pink, whereas what we were looking for was the white rose. We tried to explain this, and suddenly Roop Singh perked up and said, “Oh ! you mean ‘kuza’” and told us he knew where it could be found. We were not certain that he meant our rose. It was also getting fairly late in the evening, but overcoming his protests, we bundled him into the jeep, and off we left for Oriya village, and there, to our huge delight, we found the rose, extensively planted as hedges around farmers fields, situated just above a lake. But not a trace of flower or fruit could we find.

Back again the next morning, we had a real stroke of luck when we discovered a stem bearing a cluster of flowers. As often happens, one discovery led to another, and soon we came across a number of flowers on a plant which had climbed the top of a tree nearby, on a hedgerow. Having collected a fair amount of cuttings we returned in triumph to the Forest Bungalow, where a detailed comparison of the characteristics with the literature brought by Dr. Parmar confirmed that we had indeed got *R. clinophylla*. Yippee!!!

Curiously enough, though we spent two more days in Mount Abu we could not locate the plant in the wild and all that could be found were the roses planted in hedges in Oriya village, which were apparently in some danger of extinction as the hedges are being replaced by stonewalls by the farmers.

On the day before we left Mt. Abu we went again to Oriya village and took several specimens and also several photographs of the area, and plants. We were lucky to locate a few smaller plants nearer the waters of the lake, but even these appeared to be suckers rather than seedlings, and we collected a few. In spite of intensive search we could not find any seed and the local farmers told us that they propagate the rose by cuttings and never by seed.

As seen at Mt. Abu, *R. clinophylla* (*lyelli*) is a very long lived plant. Several of the plants in the hedges had bases 8" to 9" thick with gnarled treelike bark. Some of the specimens were 15' high and along a village path we found several in bloom with clusters of very attractive flowers, considerably larger than the Ranchi form which I had mentioned earlier.

Subsequently, we found to our surprise that we had collected this rose at exactly the same point where a George King had found it as far back as 1868! [5].

It was quite clear that the rose was in grave danger of extinction. Earlier on, apparently, it could be found in several places around Mt. Abu, even next to the Forest Bungalow, where we were staying (and which had a lake beside it).

So, armed with several cuttings, budsticks and suckers of the rose, we returned to Kodaikanal. Out of nearly 100 cuttings, not one succeeded, but rooted suckers have survived, as well as two of the budeyes, budded on R. *multiflora.* By now (October 1992) the biggest plant is 5' tall with several basal shoots, looking as could be expected, much happier in the cold climate of Kodaikanal, than the Ranchi clone.

Interestingly enough, we notice subsequently, that the same rose called 'kuza' in Abu, was referred to as 'kuzia' in the Doon Valley, as stated by Firminger in "Gardening in India").[6]

The Abu form of clinophylla is now being re-introduced in the wild, with the enthusiastic cooperation of the Rajasthan Forest Department in suitable areas around Mt. Abu: As seen in Kodaikanal it is quite a beautiful plant with lovely glossy leaves and, hopefully, it will contribute to the development of good roses for India.

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Ib. Prickles pointed downwards. Leaflets glandular on midrib and glaucous beneath, apex acute, margin distantly serrate. Hypanthia slightly glandular, pedicels distinctly glandular. Flowers in corymbs, 3-7 together. Sepals with few appendages .... *R. lyelli*

Copies of the original

Indian Rose Annual 1993

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Hillview, Fernhill Road, Kodaikanal-624 101, Tamil Nadu.

cies at least commonly placed under the present name, the one the swamploving, the other the dry soil plant. In some respects, the Manipur form is suggestive of a third, that comes near to Rosa Bracteata ".

" The assemblage of wild roses of tropical (or perhaps sub-tropical) India is an important one nevertheless, and Col. D. Prain refers to R. Involucrata to three varieties (which perhaps meets the case) but the these should be added R. Lyelli, an even still more mountainous form, their representative in the lower N. W. Himalayas and from thence to Rajputana and South India. Where met with, the plants, usually regarded as Involucrata, are plentiful enough, but between one locality and another a gap of many thousands of square miles may interpose over which the plant seems to possess no inclination to spread ; e.g. on passing north east from Sylhet " (now in Bangla Desh) " it disappears and on the road from thence via Cachar to Manipur—a distance of over 120 miles in a direct line—it is nowhere met with until the valley of Manipur proper is reached, when, at altitudes of from 2,500 to 4,000 feet, what I have suggested as being possibily the Chinese form in the assemblage is found, not only plentiful but, I might almost say, characteristic. This sudden appearance and disappearance in Eastern Bengal is that which the species everywhere manifests throughout its Indian area ".

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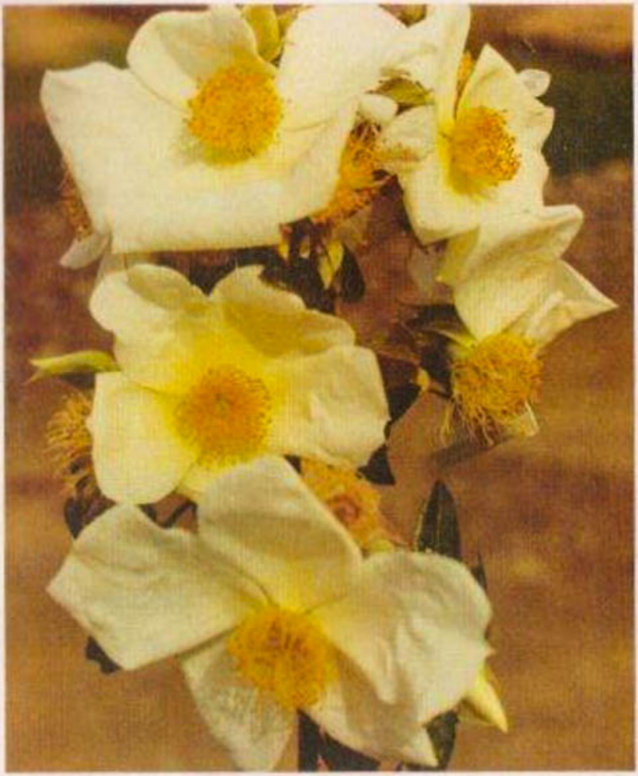
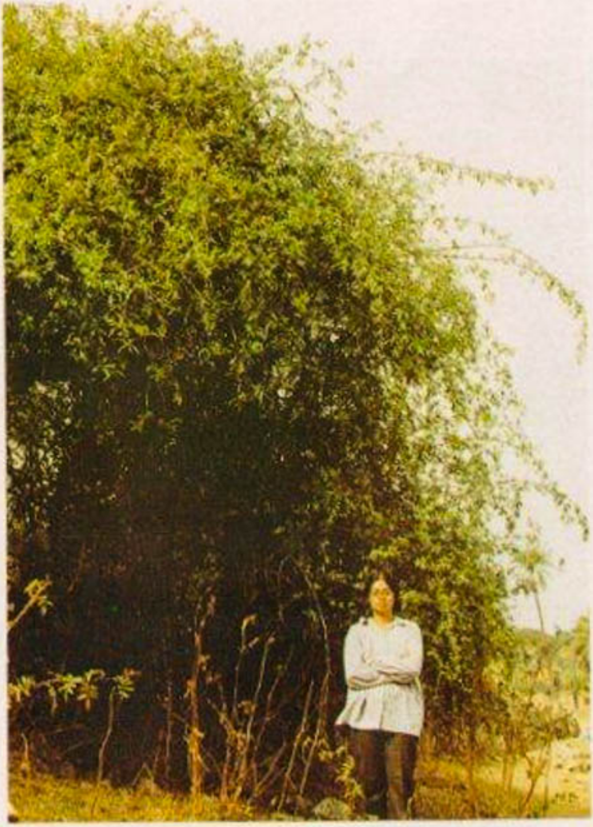


R. Clinophylla, Mount Abu form, photographed in the wild, January 1992.



Bush of R. Clinophylla, Mount Abu form, growing on field boundary, Oriya Village, Mt.Abu. Note the size of the plant.

R. Clinophylla proper (with two additional varieties) and R. Lyelli. In other words, according to this paper, R. Clinophylla in India, exists in three forms—R. Clinophylla itself, R. Clinophylla var. parvifolia (i. e. small leaved form) and R. Clinophylla var. glabra (i.e. hairless form but with larger leaves.) R. Lyelli is held to be a different species but from a horticulturist's point of view, the main differences are slight indeed, consisting mainly of the thorns pointing downward, as against the slightly upward pointing thorns in the Clinophylla group.

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1b. Prickles pointed downwards. Leaflets glandular on midrib and glaucous beneath, apex acute, margin distantly serrate. Hypanthia slightly glandular pedicels distinctly glandular. Flowers in corymbs, 3–7 together. Sepals with few appendages........................ R. Lyelli

Indian Rose Annual - IRA 1994

Rose Pigments and Rose Breeding --- The Findings of C.H. Eugster and E. Marki-Fischer, and Their Application

M. S. Viraraghavan

In this article an attempt is made to summarize, from the layman's point of view, the conclusions that can be derived from a very important paper on the chemistry of rose pigments by C. H. Eugster and E. Märki-Fisher.

As could be expected, the main paper is highly technical, and requires a strong chemistry background, if one is to understand it. Also, as often happens, while the research conclusions are of great practical importance to rose breeders, the paper itself is directed to an entirely different class - organic chemists.

So an attemp: to bridge the gap, whatever its limitations, is very much in order. Readers may like to refer to my earlier article ‘New approaches to rosebreeding - the Arisumi papers' (Indian Rose Annual II, 1982) especially as the researches of the present authors are closcey connected with the earlier work of Dr. Arisumi.

Most of you are quite familiar with the basic information on rose pigments, which has been presented often enough in our annuals. In a nutshell, the colours of rose flowers are determined by two classes of pigments - the water soluble anthocyanins, and the closely related flavonols, which produce the red, pink and white shades, and the water insoluble carotenoids, which produce the bright yellow shades.

A very interesting feature of the paper is the conclusion, 'the great structural diversity of the carotenoids (in roses) contrasts with the surprisingly small number of anthocyanins'. In fact the structure of 75 different types of carotenoids are elucidated.

In this background, what are the important conclusions which can be derived which are of interest to rosebreeders? The first set of these radically alters our perceptions of the natural occurence of rose pigments.

1. It is now part of rose folklore that the vermillion orange colour of roses is derived from the anthocyanin, pelargonidin, which first made its appearance, by mutation, in the polyantha, Gloria Mundi, and thereafter, in various roses of the type of Independence (1947), Super Star (1960) etc., culminating in modern vermillion roses too numerous to mention, But the authors establish that this is completely incorrect - very many old roses, e.g. the alba rose Konigin von Dänemark (1916), the hybrid perpetual, Général Jacqueminot (1853), the multiflora hybrid, Crimson Rambler (pre 1890) and the first yellow rose, Soleil d'Or (1900) contain significant quantities of pelargonidin. Even more surprising is the finding that many rose species - *Rosa rugosa*, *Rosa pendulina, Rosa willmottiae, Rosa pomifera* and Rosa gallica 'Versicolor' - which originate in quite different parts of the world, also contain this pigment.

2. One more part of rose folklore is that the carotenoid yellow colours arose only after the introduction of the Persian Yellow rose, *Rosa foctida* into the blood of modern roses, due to the well known work of the great French hybridist, Pernet Ducher, starting of course with Soleil d'Or. This again is modified by the authors who point out that many of the old yellow roses, such as the Tea and Noisette classes with a Chinese background, also contain carotenoid. The only difference is that the latter roses contain carotenoids from early stages in the biosynthesis whereas *Rosa foetida* derivatives contain more complex carotenoids, which, incidentally, have better colour stability.

These two major conclusions apart, certain very interesting possibilities for rose breeding emerge:

1. Better red roses

In addition to the anthocyanin, cyanidin, there is another closely related red pigment, chrysanthemin. If breeders could produce roses rich in chrysanthemin, we would have 'surprising red shades'. Rose varieties containing large quantities of chrysanthemin include the climbers François Juranville and Dorothy Perkins, and, of much more interest to Indian rose breeders, Souvenir de la Malmaison, which is widely grown in India. Some work with Souvenir de la Malmaison should be quite rewarding.

One other red pigment found in roses is paconin, and here the source accessible to Indian breeders is, surprisingly, *Rosa foetida* - perhaps not so surprising, as many rose breeders have noted that crosses with yellow roses result in better reds.

2. Better yellow and orange roses

There is an interesting conclusion that the bright orange roses e.g. Louis de Funès (Meilland, 1984) are derived from a mixture of the pigment, cyanidin mixed with carotenoid. This, in a way, contradicts, though not directly, the Arisumi conclusion that it is a mixture of pelargonidin and carotenoid which produces the orange shades.

As any rose grower is instinctively aware, the colour of yellow or orange roses is hardly as bright as in other garden flowers, e.g. nasturtium. This has been scientifically confirmed by the authors who show that the degree of colour saturation is much less in roses than in, for example, nasturtiums, with the nasturtium having a factor of 80 as contrasted with around 50 for the rose, as an index of colour saturation.

In roses, the degree of colour saturation in the parental species, *Rosa foetida* has not yet been reached and this is what breeders have to aim for.

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tomato red, if the pigment composition includes greater quantities of certain carotenoids found in large quantities in the old Noisette and Tea roses - William Allan Richardson and Alister Stella Gray, which used to be quite well known in India some time back. So here is another breeding opportunity.

Some fascinating sidelights are also provided, such as :

1. The famous Noisette climber, Maréchal Niel, shows different pigment composition if grown in a greenhouse, where the colour is primrose yellow, but much lighter when grown outside, owing to replacement of one pigment by another. What then happens in India where the outdoors is quite like a greenhouse in the West?
2. Many white roses, e.g. Virgo, Iceberg, etc., contain large quantities of carotenoids.
3. The bronze colour, which is so attractive from the rose breeding point of view, is due to an admixture of flavonols in high concentration, with carotenoids. This is proved experimentally for roses as far apart as the Noisette, William Allen Richardson (1878) and the Hybrid Tea, Whisky Mac (1967),

For those who are interested, a copy of the full paper can be obtained from the Editors.

REFERENCE:

1. The Chemistry of Rose Pigments - Prof. Dr. Conrad Hans Eugster, Dipl.-Chem. Edith Märki-Fischer, Angewandte Chemie, International Edition in English, Vol. 30, June 1991, pgs 654 - 672

Copies of the original

Indian Rose Annual 1994

Rose Pigments and Rose Breeding – The Findings of C. H. Eugster and E. Marki-Fischer, and Their Application

—M. S. Viraraghavan

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As could be expected, the main paper is highly technical, and requires a strong chemistry background, if one is to undertand it. Also, as often happens, while the research conclusions are of great practical importance to rose breeders, the paper itself is directed to an entirely different class—organic chemists.

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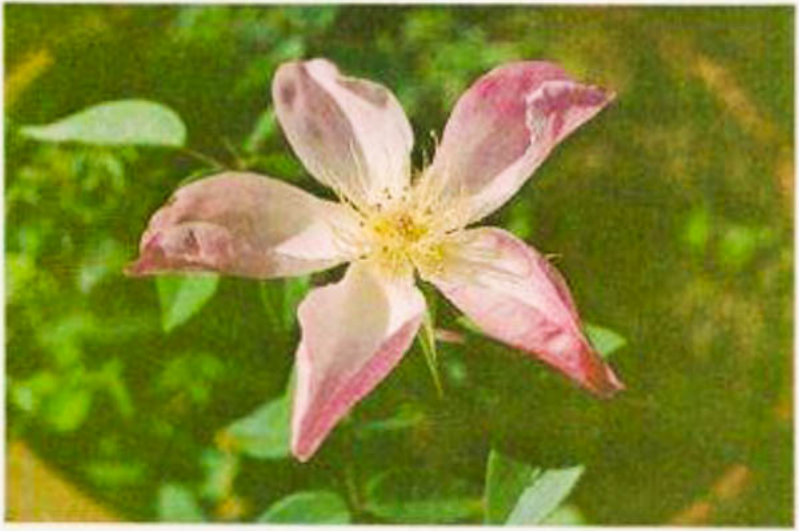
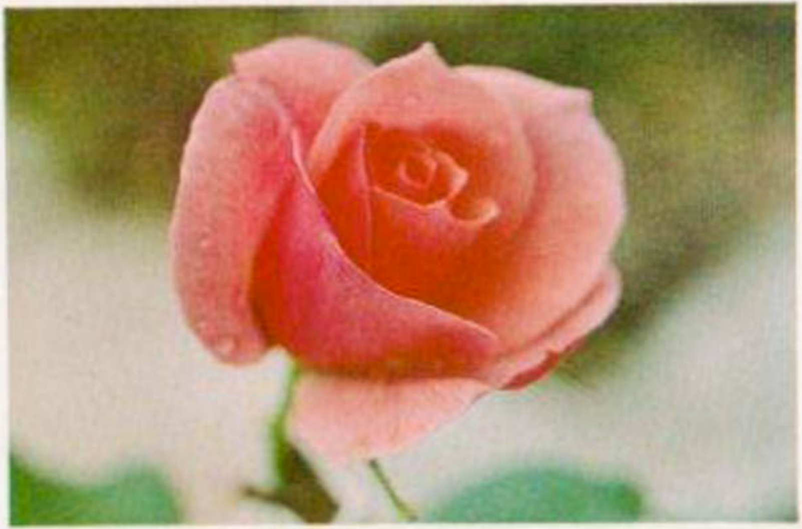
Progress in breeding with R. clinophylla



The first generation :
Mrs. B.R. Cant x R. clinophylla - M.S. Viraraghavan



The third generation :
Montezuma x [Little Darling x (R. clinophylla
x R. bracteata)] - M.S. Viraraghavan

Rosa Gigantea Blooms In Kodaikanal

M. S. Viraraghavan

The accompanying photograph shows the first flower on a seedling of Rosa gigantea raised from seed collected on the footpath leading to Mount Sirohi, beyond Ukrul in Manipur State, at about 7,000 feet altitude.

Rosa gigantea, which the great plantsman Graham Stuart Thomas refers to as "the queen, the Empress of wild roses", is by far the largest growing of all wild roses, reaching upto 50 feet. The rose was first discovered in 1882 by Sir George Watt, Surveyor General of India, and a keen botanist, in Manipur. He charmingly describes the rose as climbing large trees and blooming in cascades from the uppermost branches, making the trees look like golden magnolias. The most interesting feature of the rose, apart from its extra-ordinary vigour, is the giant size of the flower, which is invariably cream or light yellow, (in the Manipur form), and reputed to reach 6 inches across. This species, which is rudely healthy, has contributed one of the most fascinating characteristics of the modern rose - the beautiful, high centred form. The photograph shows this aspect.

Seeds of two forms of the rose species were collected in January 1991 at Sirohi, the first with fruit (hips) about 1/2 inch across and the other much larger, well over 1 inch in diameter, hence Sir George Watts' original name *R.* m*acrocarpa*. Seeds of both forms germinated within one month of being sown in March 1991 and about 50 seedlings, mainly of the smaller form have been planted out in various places in my garden around November 1991. The first flowers were produced in November this year (1994) on a seedling of the smaller form - the first flowers were about 4 1/4 inches across.

Buds are also now visible in one of the vegetatively propagated plants of the larger form, budded on *Rosa multiflora*.

While on the subject of propagation of this rose, none of the over 100 cuttings of both forms rooted, excepting for one of the larger type. Though transplanted with the utmost care, the rooted cutting started to wilt and turn black from the root upwards. In order to save the plant, the top portion which was still green was snipped off and made into a water cutting, i.e., immersed in a glass of water and kept in a well-lit part of the greenhouse (not in the direct sun). The water in the glass was changed once a week, and astonishingly enough, after a month callus formed, and a few roots produced in 2 months time. This water cutting is now a bush some 8 feet high and hopefully, will also flower later this year.

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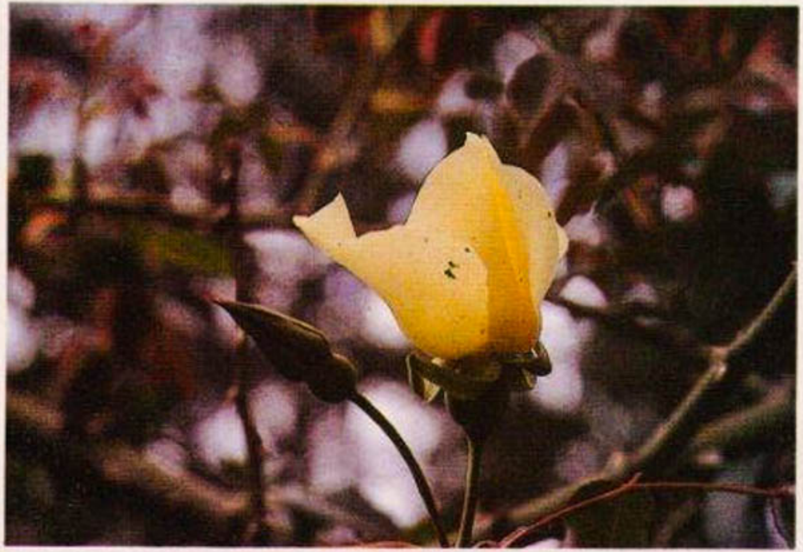
Indian Rose Annual 1995



R. gigantea collected in the wild Mt. Sirohi, Manipur - M.S. Viraraghavan

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Hillview, Fernhill Road, Kodaikanal-624 101.

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Indian Rose Annual - IRA 1998

Is R. clinophylla the Lotus of the Rose World?

M.S. Viraraghavan

Those of you who had read Dr. N.C. Sen's interesting article on how he grows *R. clinophylla (R. involucrata*) in Asansol in West Bengal (in Indian Rose Annual XI, 1993) would have noted the fascinating and curious observation he makes quoting the eminent horticulturist, Shivaprasad Bannerjee. Bannerjee says that he searched for this rose species which used to grow in the lowlands of Bengal like *the lotus* in the past, and he finally collected a specimen in the early 1960's in Uddaranpur village of Murshidabad District of West Bengal on an island off the bank of the River Padma, one of the smaller rivers which takes off from the main River Ganges.

In the same article it is mentioned how Bannerjee found a specimen 'partially drowned in the inundated island'. Material propagated from Bannerjee's original plant has been successfully cultivated by Dr. Sen in Asansol under normal garden conditions.

In January 1991 I had collected the other prominent species of Eastern India, *R. gigantea*, on the lower slopes of Mount Sirohi near Ukhrul, a small town situated some 30 miles uphill from Imphal, the capital of Manipur State. My experiences are described in Indian Rose Annual XIII0,, 1995 and in a series of articles in Rose News in 1991.

In this background it is of great interest to reproduce below copies of some original correspondence dating to 1888 between Mr. David Prain, the Curator of the Calcutta Botanical Gardens at Sibpur and the noted Belgian botanist, M. Crépin, Director of the State Botanical Gardens at Brussels. These papers are reproduced courtesy of Mr. Ivan Louette of Belgium who patiently searched the archives ol the Herbarium in Brussels to trace these letters.

Royal Botanic Garden
Seebpore
Near Calcutta
June 2 1888

M. Crépin
Director du
Jardin Botanique de l'Etat
Bruxelles

Dear Sir,

I ought to apologize for not sooner answering your very kind letter of 12th March. We have here in Calcutta long known M. Crépin by reputation and I am very highly honoured to now know you by correspondence. I am very much obliged indeed for your publication which I have received in safety.

I am not able to tell you much about R. involucrata. It was just beginning to flower when I wrote to you last and it continued to bear flowers till the first week of April. Since then it has ceased to flower and all its leaves have fallen. It now (just at the end of the hot season and as we are expecting the arrival of the rains) stands bare of leaves and flowers. I shall let you know later on when the leaves appear and the other incidents *of its annual cycle as they occur. I have made a collection of good flowers for you but I do not send them yet as no good fruit formed after their flowering.*

You ask if R. lyellii is still cultivated here. Dr.King, Superintendent of the Garden who has been here many years never knew it being tried prior to his. It will not grow here. This is true of the other forms you mention also. Indeed the only one which grows freely here is the one which is found spontaneously growing in the Ganges and Brahmaputra delta, R. involucrata.

Mr. Duthie has far greater opportunity of getting roses of India than we but still we can get some and I have great pleasure in sending you by this post one which I hope maybe of interest to you. It has been tint to me by General Collett C.B. who commands one of the Brigades of the Army in Burma. He has collected it in the Shan Hills - between Burma proper and Siam - and describes it as a magnificent plant with pure white flowers 5 inches in diameter the plant sprawling over rocks and trees.

I have not attempted to do more than to reassure myself that it has not been hitherto described by an Indian author. General Collett himself in his list calls it 'my new rose' - R. gigantea, and asks if I think it new.

I have told him that I am sending his specimens direct to you so that he may have the verdict of the greatest authority on his rose. As I learn from your papers that you have the Yunnan specimens of Franchet and Savatier at you disposal and that you have described at least one new species from that region I will not be surprised to hear that you have already got it, but if you have not I would be very much obliged if you could let his name stand, if the name 'gigantea' is not already foreclosed, or if 'gigantea' be an inadmissible name, if you will call it after General Collett. He is one *of our most skilful generals and what I daresay you will agree with me in thinking is of much greater moment one of our most ardent field botanists.*

I shall hope to hear from you at your convenience about General Collett's Rose and shall promise myself the pleasure of writing to you again when I will send you other specimens of roses.

At present owing to the absence of Dr. King, the whole of the work of the gardens as well as of the herbarium fall upon me, and the work of a large garden in a climate where growth is so rapid as is this, is no easy task.

With very kind regards,
Believe me
Sincerely Yours,
David Prain

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Royal Rotanic Garden
Shibpur, Near Calcutta

Dear Mr. Crépin,

I enclosed General Collett's replies to your queries regarding Rosa gigantea Collett . The general is, I believe, trying to bring away some samples with him.

Since I wrote to you last I have learned a very curious fact concerning Rosa involucrata. I may have told you that it is less common in, that is to say in the delta of the Ganges and Brahmaputra than it is in Sylhet *which is drained by the Megna, a smaller but still considerable river of the same distributionary character. The Sylhet plains are less populous than those of Lower Bengal, the people depend largely for their food supply upon fishing the creeks and tributaries, and distributaries of the main river are not confined to their beds by means of 'bunds' (the Indian term for embankments to keep out water). So that when the river is above its cold weather level, it and more or less all of its branches, overflow the adjacent plain at many points. So much so indeed the month of June, and from then on to the month of October, the plain is a series of Jheels (that is, 'lakes' which dry up during the weather) and travellers whose only conveyance during the rains is by boat, do not keep to the main river or to its branches except in a very general way, but escape from these to the jheels, where the water can always be found from 3 to 5 feet deep, deep enough for the draught of Indian country boats in this way often saving space by using as their slack the chord of a wide bend of the river, and saving time by avoiding the force of the current.*

The chief of the Post Office in the province of Oudh - R. Rose Esq.- an ardent gardener himself, visited these gardens last week and told me that a year ago he was ordered to go down to Dacca in East Bengal to have charge of the postal arrangements for this postal province (which includes Sylhet) for some time. While there, his duties took him on a journey such as I have described, and he found when sailing though these jheels that from end to end of the province they were full of a wild rose, hitherto unknown to him, which had no leaves upon it and was in full fruit only the fruits being above the water. This fact he had mentioned on returning to Lucknow to his friends there who said it could not be a rose at all, but he had brought seeds away with him; some of which germinated and throve quite well till the ensuing hot weather (that is, April) when all died one by one within a month.

This account is that of a very observant man, and it supplies at one moment an explanation to all the difficulties I have had in considering the habits of this rose.

It shows by direct experiment why the North West of India botanists have given no account of Rosa involucrata. It could not grow with them and they therefore could not see it alive.

It explains why at this season when other tropical plants with hardly an exception is in full foliage or renews its foliage in the rains this Rose loses its leaves as I told you, at the outbreak of these (this year just a little earlier but then the rains were this year delayed) and remains bare and unsightly all through the rains. I counted the leaves on the bush I am watching on your account the other day and it did not have 5 leaves altogether, having about 30 branches. Hitherto we have not grown any of this rose in water. This we will now proceed to do. Some of our lakes are not connected with the river. These therefore are deeper by 3 or 4 feet in the rains than in the cold weather. I shall have some plants put in at the water's edge when the lake is low this will pretty nearly correspond to its natural habitat - then it may bear fruits. Mr. Rose's account hardly affords an explanation of why it does not fruit freely here but it gives the hint as to an experiment which may explain this.

With kind regards,

Yours sincerely

David Prain

A perusal of the above two letters establishes clearly that *R. clinophylla* was in fact growing like the lotus a hundred years back in many areas of Bengal though it is now confined to a few localities because of human pressure. But more important is the unique habitat described, of a rose which grows in the water with only the fruits visible above the water surface during the monsoon period.

Hybridizing with such a rose as one parent could possibly lead to roses entering the field of water gardening - an intriguing possibility first mentioned by the well known rosarian, Peter Harkness.

In order to confirm the possibility of growing *R. clinophylla* in water a small scale experiment was started in Kodaikanal using not *R. clinophylla* of which the plants available are too few to be risked, but some hybrid seedlings of *clinophylla* crossed with the closely related species, *R. bracteata*. Plants grown in bags and pots were immersed in a cement tank in my house with only the top of the stems above the water level. In nearly six months all the plants have successfully adapted to this environment and one in fact has flowered. As could be expected, since the experiment has been done with species hybrids among which there is variation, some of the plants look happier than the others while it is too early to be categorical it can be said that the experiment indicates the possibility of ultimately raising rose hybrids which grow in water or at least hybrids well adapted to water logged conditions.

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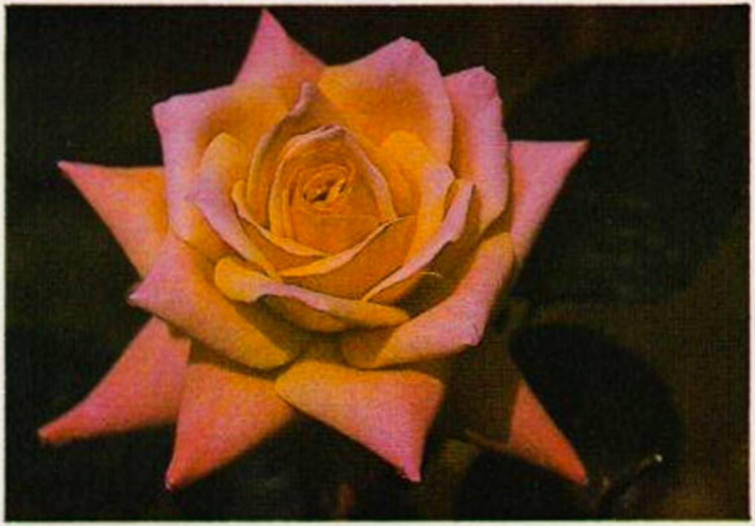
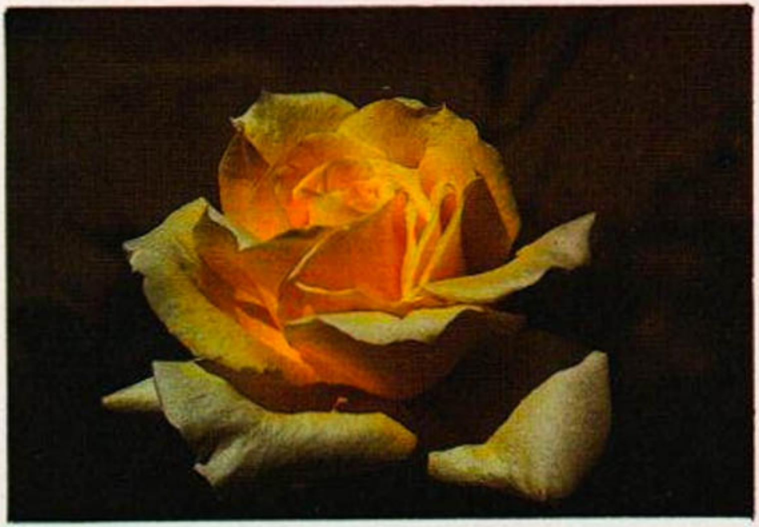


H.T. seedling from cross Fergie x (First Prize x Valencia)
M.S. Viraraghavan



The first H.T. seedling to appear in the new R. clinophylla strain,
bred from Landora x {Montezuma x (Little Darling x
[R. clinophylla x R. bracteata])}
M.S. Viraraghavan

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Dear Sir,

I ought to apologize for not sooner answering your very kind letter of 12th March. We have here in Calcutta long known M.Crepin by reputation and I am very highly honoured to now know you by correspondence. I am very much obliged indeed for your publication which I have received in safety.

I am not able to tell you much about R. involucrata. It was just beginning to flower when I wrote to you last and it continued to bear flowers till the first week of April. Since then it has ceased to flower and all its leaves have fallen. It now (just at the end of the hot season and as we are expecting the arrival of the rains) stands bare of leaves and flowers. I shall let you know later on when the leaves appear and the other incidents of its annual cycle as they occur. I have made a collection of good flowers for you but I do not send them yet as no good fruit formed after their flowering.

You ask if R. Lyellii is still cultivated here. Dr.King, Superintendent of the Garden who has been here many years never knew it being tried prior to his incumbency. It will not grow here. This is true of the other forms you mention also. Indeed the only one which grows freely here is the one which is found spontaneously growing in the Ganges and Brahamaputra delta R. involucrata.

Mr. Duthie has far greater opportunity of getting roses of India than we but still we can get some and I have great pleasure in sending you by this post one which I hope maybe of interest to you. It has been sent to me by General Collett C.B. who commands one of the Brigades of the Army in Burma. He has collected it in the Shan Hills - between Burma proper and Siam - and describes it as a magnificent plant with pure white flowers 5 inches in diameter the plant sprawling over rocks and trees.

I have not attempted to do more than to reassure myself that it has not been hitherto described by an Indian author. General Collett himself in his list calls it 'my new rose' - R. gigantea, and asks if I think it new.

I have told him that I am sending his specimens direct to you so that he may have the verdict of the greatest authority on his rose. As I learn from your papers that you have the Yunnan specimens of Franchet and Savatier at you disposal and that you have described at least one new species from that region I will not be surprised to hear that you have already got it, but if you have not I would be very much obliged if you could let his name stand, if the name 'gigantea' is not already foreclosed, or if 'gigantea' be an inadmissible name, if you will call it after General Collett. He is one of our most skilful generals and what I daresay you will agree with me in thinking is of much greater moment one of our most ardent field botanists.

I shall hope to hear from you at your convenience about General Collett's Rose and shall promise myself the pleasure of writing to you again when I will send you other specimens of roses.

At present owing to the absence of Dr. King, the whole of the work of the gardens as well as of the herbarium fall upon me, and the work of a large garden in a climate where growth is so rapid as is this, is no easy task.

With very kind regards,

Believe me

Sincerely Yours,

David Prain

Royal Rotanic Garden

Shibpur

Near Calcutta

Dear Mr. Crepin.,

I enclose General Collett's replies to your queries regarding Rosa gigantea Collett mp. The general is, I believe, trying to bring away some living examples with him.

Since I wrote to you last I have learned a very curious fact concerning Rosa involucrata. I may have told you that it is less common in Bengal, that is to say in the delta of the Ganges and Brahmaputra than it is in Sylhet which is drained by the Megna, a smaller but still considerable river of the same distributionary character. The Sylhet plains are less populous than those of Lower Bengal, the people depend largely for their food supply upon fishing the creeks and tributaries, and distributories of the main river are not confined to their beds by means of 'bunds' (the Indian term for embankments to keep out water). So that when the river above its cold weather level, it and more or less all of its branches overflow the adjacent plain at many points. So much so indeed that by the month of June, and from then on to the month of October, the whole plain is a series of Jheels (that is, 'lakes' which dry up during the cold weather) and travellers whose only conveyance during the rains is by boat, do not keep to the main river or to its branches except in a very general way, but escape from these to the jheels, where the water can always be found from 3 to 5 feet deep, deep enough for the draught of the Indian country boats in this way often saving space by using as their slack the chord of a wide bend of the river, and saving time by avoiding the force of the current.

The chief of the Post Office in the province of Oudh-R.Rose Esq.- an ardent gardener himself, visited these gardens last week and told me that a year ago he was ordered to go down to Dacca in East Bengal to have charge of the postal arrangements for this postal province (which includes Sylhet) for some time. While there, his duties took him on a journey such as I have described, and he found when sailing though these jheels that from end to end of the province they were full of a wild rose, hitherto unknown to him, which had no leaves upon it and was in full fruit, only the fruits being above the water. This fact he had *mentioned on returning to Lucknow to his friends there who said it could not be a rose at all, but he had brought seeds away with him; some of which germinated and throve quite well till the ensuing hot weather (that is, April) when all died one by one within a month.*

This account is that of a very observant man, and it supplies at one moment an explanation to all the difficulties I have had in considering the habits of this rose.

It shews by direct experiment why the North West of India botanists have given no account of Rosa involucrata. It could not grow with them and they therefore could not see it alive.

It explains why at this season when other tropical plants with hardly an exception is in full foliage or renews its foliage in the rains - this Rose loses its leaves as I told you, at the outbreak of these (this year just a little earlier but then the rains were this year delayed) and remains bare and unsightly all through the rains. I counted the leaves on the bush I am watching on your account the other day and it did not have 5 leaves altogether, having about 30 branches. Hitherto we have not grown any of this rose in water. This we will now proceed to do. Some of our lakes are not connected with the river. These therefore are deeper by 3 or 4 feet in the rains than in the cold weather. I shall have some plants put in at the water's edge when the lake is low this will pretty nearly correspond to its natural habitat - then it may bear fruits. Mr. Rose's account hardly affords an explanation of why it does not fruit freely here but it gives the hint as to an experiment which may explain this.

With kind regards,

Yours sincerely

David Prain

A perusal of the above two letters establishes clearly that R. clinophylla was in fact growing like the lotus a hundred years back in many areas of Bengal though it is now confined to a few localities because of human pressure. But more important is the unique habitat described, of a rose which grows in the water with only the fruits visible above the water surface during the monsoon period.

Hybridizing with such a rose as one parent could possibly lead to roses entering the field of water gardening-an intriguing possibility first mentioned by the well known rosarian, Peter Harkness.

In order to confirm the possibility of growing R. clinophylla in water a small scale experiment was started in Kodaikanal using not R. clinophylla of which the plants available are too few to be risked, but some hybrid seedlings of clinophylla crossed with the closely related species, R. bracteata. Plants gorwn in polythene bags and pots were immersed in a cement tank in my house with only the top of the stems above the water level. In nearly six months all the plants have successfully adapted to this environment and one in fact has flowered. As could be expected, since the experiment has been done with species hybrids among which there is variation, some of the plants look happier than the others while it is too early to be categorical it can be said that the experiment indicates the possibility of ultimately raising rose hybrids which grow in water or at least hybrids well adapted to water logged conditions.

Indian Rose Annual XV - IRA 1999

National Rose Convention at Jabalpur, Madhya Pradesh State

Better Roses for the Tropics - Breeding with *R. gigantea*

M.S. Viraraghavan

Rosa gigantea, described rapturously as the "Empress of wild roses" by the great rose authority, Graham Stuart Thomas, is perhaps the most attractive of India's wild roses. Sir George Watt who discovered the species in Manipur, likened the flowers to golden magnolias appearing in profusion above the tree tops in its native habitat. Apart from the beauty of the flower, and extraordinary vigour, the species is blessed with lovely large disease resistant foliage. My plants in Kodaikanal raised from seed collected in Manipur in 1991 have never suffered from either blackspot or mildew.

The remarkable prospects of breeding with *R. gigantea* have been highlighted by a galaxy of eminent rosarians, including Swami Vinayananda who, in a thought provoking article, "Breeding is the Word" published in the commemorative brochure brought out at the 11th All India Rose Convention at Calcutta in 1991, has quoted the incomparable breeder, Jack Harkness in his book "Roses" (Published in 1978). "Because most Western rose breeders have been concerned with breeding hardy roses" (in the Western context - it means that it can stand severe winters) "it follows that the tender *R. gigantea* has been of little interest to them. That should not stop research by breeders in warm climates".

Jack's brother, Peter Harkness is even more enthusiastic. He says, "as these roses embody six great virtues - health, beauty, vigour, scent, good foliage, and remontancy, further direct use in breeding seems worthwhile".

On the subject of growing *R. gigantea* I had written a detailed review in the Indian Rose Annual, 1998. Before going into details of what has been achieved in breeding with this species in Kodaikanal, it is appropriate to deal briefly with the work of the great pioneers. It should be kept in mind here that probably only the Chinese or Burmese form of *R. gigantea* was used in this early work, which makes breeding with our Manipur version even more replete with possibilities.

One of the earliest successful crosses was 'Belle Portugaise', introduced by the breeder Cayeux in 1903, a very vigorous, light pink, once flowering climber, but inheriting the tender nature of the species. Other pioneer breeders include the Frenchman, Nabonnand, who introduced a series of climbing roses with *R. gigantea* as one parent. Working in Southern France, his varieties include 'Emmanuella de Mouchy' (rich carmine rose), 'Fiametta' (Indian Yellow, single) and 'Sénateur Amic' (Cochineal carmine). Both 'Emmanuella de Mouchy' and 'Sénateur Amic' are still available through old rose specialists, though not in India. Also in the 1920's, though work continued till early 1940, was that of an Australian, Alister Clark, whose most well known rose was 'Lorraine Lee', a pink shrub rose which is still quite popular in Australian gardens. Other interesting Clark roses include 'Nancy Hayward' (rich pink), and 'Kitty Kininmonth' (bright carmine rose), both climbers. None of these roses seem to have been grown in India, where probably the absence of severe winters would have resulted in very sparse flowering as these early hybrids were all once flowering types.

Slightly later, the Reverend George Schoener came on the scene, of whom a recent write up by a well known garden writer, Mr. William Grant entitled "Padre of the Roses" appeared in the journal, Pacific Horticulture. Though endowed with great energy and enthusiasm, as well as considerable knowledge of rose breeding, Fr. Schoener's work was plagued by a series of natural calamities including fire in his garden in Oregon, in the Pacific North West of U.S.A., and hurricanes in his later garden in Santa Barbara, California. Talented but unlucky, none of his numerous *R. gigantea* hybrids are available today, but a breeder attempting to work with this species has much to learn from Fr. Schoener's writings. In an illuminating article on "*R. gigantea* and allied species" in the American Rose Annual, 1932, he has dealt at length with the innumerable possibilities of work with this species. One interesting point that is made is that the Manipur form which is referred to as *R. macrocarpa* (because of its large fruits) is considered even more promising for breeding. In close collaboration with Fr. Schoener was the Boyce Thompson Institute in Yonkers, New York, especially its Director, Dr. Crocker. Dr. Crocker writes, talking of the gigantea seedlings raised by Fr. Schoener, "I feel that you will have greenhouse roses produced by your crossings that are so much better than any others grown now that there will be no comparison. I have been specially struck by the long conical buds that appear on many of the Gigantea hybrids, and the wonderful colouring and texture of the petals. Some of the foliage is wonderful". This opinion is entitled to great respect as it is based on observations of 20,000 seedlings of *R. gigantea*, which were the results of 1,200 combinations between the species and well known garden roses.

Three further points made by Fr. Schoener are :

1. The seedlings are by no means as frost tender as originally expected.

2. The chromosome number problems (*R. gigantea* is a diploid while garden roses are tetraploids) are quite easily overcome.
3. The bright colours of modern roses are not suppressed in the progeny of *R. gigantea.*

In addition to this, *R. gigantea*, since it is one of the grandparents of modern roses, sets seed quite easily with standard varieties and the species has that most invaluable characteristic of passing on the high centred pointed shape so beloved of rose exhibitors. In fact the experts credit *R. gigantea* with being the basis of the high centred form of H.T. roses.

As could be expected, any rose breeder in the tropics would feel compelled to have a go at working with *R. gigantea*, though the disturbing thought remains of how the results of F. Schoener's dedicated work could so completely disappear.

As mentioned in my earlier article, *R. gigantea* flowers freely in Kodaikanal - flowering starting in November and continuing till February with a peak in mid January. Interestingly, some scattered bloom occurs at various other times of the year. The flower colour in *R. gigantea* seedlings ranges from greenish-white to pure white, cream and light yellow, the latter rivalling the well known Tea rose, ‘Lady Hillingdon’, at the bud stage. Most of my work has been done with the yellowest of the seedlings.

R. gigantea sets seed easily, whether used as a seed parent or pollen parent, though it is prima facie better to use it as a pollen parent, as the F_1 generation are all once flowering. If, as is quite possible, the cross does not take, we may have the situation of growing a seedling for several years before realizing that the cross has not taken place.

In the first year work was done with *R. gigantea* as pollen parent on certain standard Hybrid Teas, which do well in my garden in Hosur, near Bangalore, as well as with some of the old China/Tea roses, as also with a few polyanthas. Pollen availability was limited that year, and of the first batch, 4 have flowered so far.

1. The cross 'Carmousine' (an orange-red H.T.) x *R. gigantea* produced a lovely climbing shrub, now 8 feet high at Kodaikanal, with exquisite dark red healthy foliage of the *R. gigantea* type, and very artistically coloured H.T. shaped blooms of giant size, 5 inches across. The colour is best described as intensified 'Lady Hillingdon'. This rose is pictured in the annual.

2. Another seedling of interest resulted from the cross of a pink miniature China rose closely resembling 'Old Blush', but much more magenta in colour, probably Ralph Moore's 'Mr. Bluebird'. With this as seed parent has come a very healthy shrub about 6 feet high with single flowers white with pink edges, which is also shown in the annual.

3. The first fully double, in fact super-double, seedling to flower was from the cross 'Rêve d'Or' (a bronze yellow Noiscttc/Tea). This is a very vigorous climber, now 12 feet high with very full flowers of light yellow strongly resembling the famous old rose 'Maréchal Niel', as is evident from the photograph.

4. The fourth of the roses to flower was a white single semi climber with good form at bud stage from the cross 'Echo' (polyantha) x the species.

In the next year, work was much easier as plenty of flowers were available on the plants of *R. gigantea*. Many combinations have been made and the seedlings are not yet at the flowering stage. Among these are crosses with the H.T.'s, 'Paradise', 'Mango', 'Apricot Spice', 'Marmalade', 'Red

Velvet', 'Arjun', 'Sandra', 'Carina' etc. Among the seedlings resulting from crosses with old roses are ('Old Blush' x *R. gigantea*), ('Madame Falcot' x *R. gigantea*), and ('Mrs B.R. Cant' (a pink Tea) x *R. gigantea*). Several species crosses have also been made and seedlings germinated, including crosses with *R. clinophylla*, and the species hybrids (*R. bracteata* x *R. clinophylla*) and (*R. bracteata x R. laevigata).*

This year the obvious next step has been taken for backcrossing the gigantea seedlings into garden roses. As Fr. Schoener had predicted, there does not appear to be a sterility problem so far.

From the above it is evident that some very interesting results could arise from this line of breeding. A great advantage in the work was the fact that though *R. gigantea* flowered in my Kodaikanal garden in winter, it was possible to take and bring back, pollen from my Hosur garden which was in full bloom in December/January. Hopefully, next year I will have something spectacular to report.

Copies of the original

Indian Rose Annual 1998

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M.S. Viraraghavan

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Hillview, Fernhill Road, Kodaikanal 624 101, Tamil Nadu

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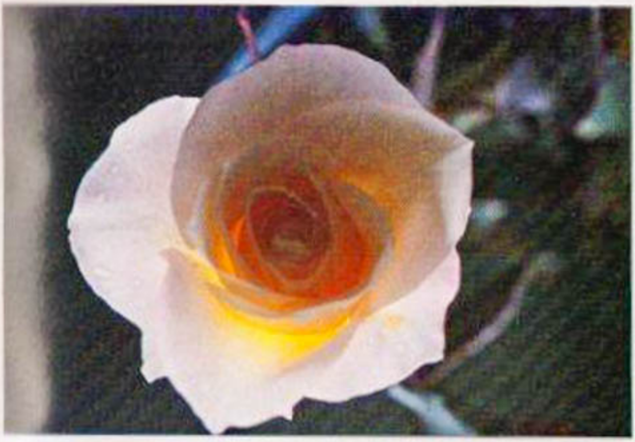
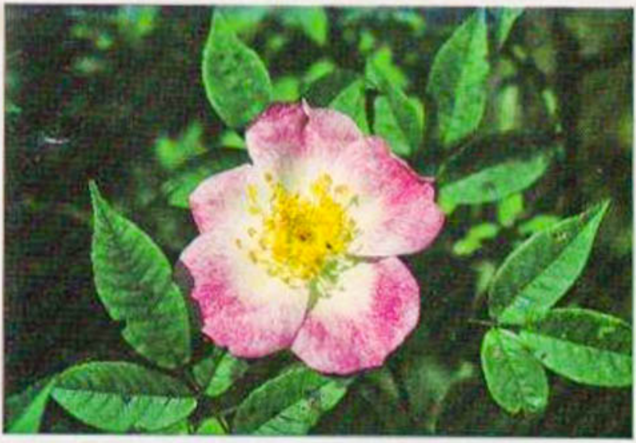


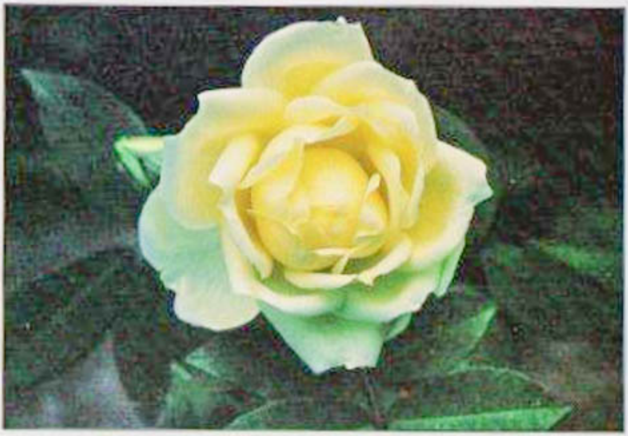
Seedling of (Carmousine x R. gigantea)

Photo courtesy : Mr. M. S. Viraraghavan



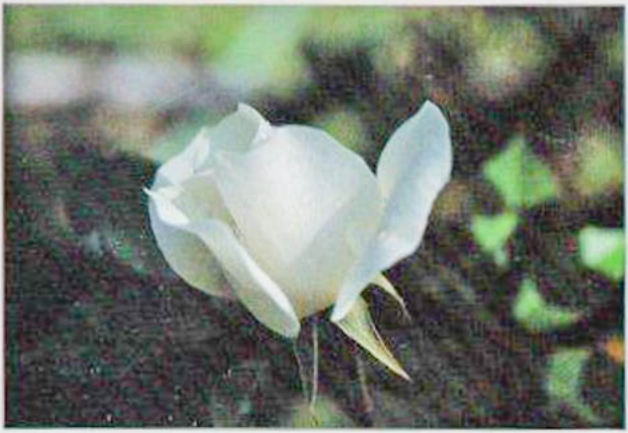
Seedling of (Pink China x R. gigantea)

Photo Courtesy : Mr. M. S. Viraraghavan



Seedling of (Rev d'Or x R. gigantea)

(Photo courtesy : Mr. M. S. Viraraghavan)



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Indian Rose Annual - IRA 2000

Tropical Rose Breeding - and beyond

M.S. Viraraghavan

There is little doubt that the rose remains the world's most popular, indeed, romantic flower, but the signs of slippage from the No. 1 position so long taken for granted, are all too evident. With the rise in the popularity of the garden centre, there are a host of other plants available for the home gardener. Again, as a commercial cutflower, the difficulties encountered in India have unfortunately had an adverse effect on cutflower rose growing which in a way provides the commercial backbone for the popularity of the rose.

The status of the rose in home gardens is understandably affected by decreasing garden size as well as increase in shade. Rose experts, especially those of the insular kind tend to depict the rose as an exclusive aristocrat which requires its own space, and no competition from other garden plants. This attitude puts off potential rosarians, especially younger gardeners (on whom surely the future of gardening depends) from attempting roses. The reputation of the rose as a difficult plant which requires constant attention is certainly a factor which influences gardeners at a time when leisure available to tend the garden with both husband and wife working, is steadily getting abbreviated.

The problem of spraying pesticides, so often (mistakenly?) held out as essential is a very real one, and tending to a small garden, surrounded by neighbours who may not be keen gardeners, becomes tedious. Environmental concerns rightly discourage the use of pesticides. In countries like Germany, where the Green movement is strong, the older award winners have slipped badly in popularity in these days of little or no spraying. But a factor of special relevance when dealing with roses in tropical and subtropical climates is the competition roses face from other tropical evergreens endowed with lovely foliage which remain attractive throughout the year.

In the tropics the true test of garden worthiness of a plant is beauty when not in flower, i.e., beauty of foliage and plant habit, in both of which roses come off second-best.

On commercial cutflower growing, a recent study by NABARD (National Bank for Agricultural and Rural Development) has established what a rose breeder could have forecast - that under the climatic conditions prevailing in India's cutflower growing regions, both the yield per unit area, as well as the quality of the flowers does not match Western standards.

While there are several reasons, the most obvious one is the reliance on cutflower varieties developed in the West which do not perform to optimum at our higher temperatures. For example, the average temperature in cutflower growing areas in India is a good 5 degrees C higher than what prevails in the corresponding locations in Israel. Clearly different varieties are required.

A serious additional problem is the need to maximise production during the Western winters when prices are highest. The competition during this time from southern hemisphere countries like Kenya, S. Africa and Colombia, which have the much easier task of maximising production in their summers is difficult to match, while growing the same varieties.

Thus it would seem that whether we consider roses in home gardens or as commercial cut flowers, drastic changes in what roses are grown, and how roses are grown, are both absolutely essential.

India's pioneering hybridiser, B.S. Bhatchaji, while emphasizing that rose growing is for the pleasure of producing beautiful flowers with normal care, pointed out that a separate line of breeding for the tropics is an absolute must.

Rose breeding in temperate climates has rightly concentrated in evolving varieties which stand up to the rigours of winter. Roses raised with this objective can hardly be expected to perform well in our Indian climate where surviving with the ability to produce good blooms in the winter rose season is what is required.

Creating such a line of heat resistant roses is not an easy task by any reckoning, as it carries with it the daunting (!) prospect of consciously reversing the basics of selection underlying Western rose breeding over all these centuries !

What are the strategies for creating such a new line? Basically, one can think of three possible methods.

1. Breeding using heritage roses like 'R. Edward' (the original Bourbon), 'Archduke Charles' (China), 'Paul Neyron' (Hybrid Perpetual), 'Cécil Brunner' (China) and numerous tea roses which do well in India.
2. Creating a new line based on selected garden roses, e.g. 'Montezuma', 'Maria Callas' (Miss All American Beauty), 'Garden Party' and the like which are well adapted to the Indian climate.
3. Work with new unused species, especially with *R. clinophylla (R. involucrata)* which is the only rose of the tropical tracts of India (and of the world?) as well as *Rosa gigantea,* which again is found in India's North East.

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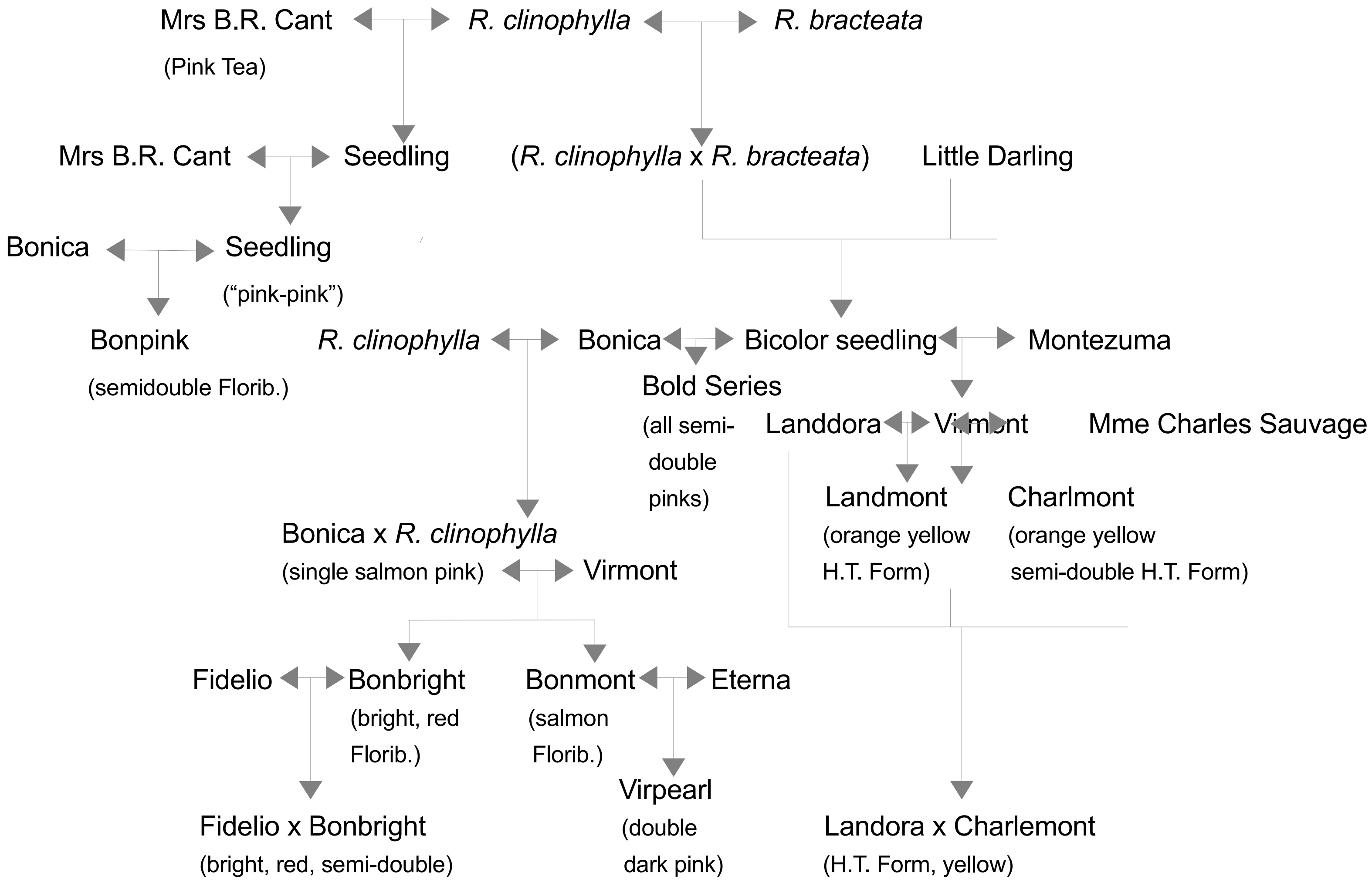
R. clinophylla Hybrids – A Family Tree



But the crucial question of whether these seedlings carry the gene for heat resistance and adaptability to waterlogged conditions remains unanswered. This can only be proved by extensive trials including the trial for that most intriguing of rose breeding prospects - Peter Harkness's suggestion that work with *R. clinophylla* could lead to a rose adapted to water gardening.

Work with *R. gigantea,* which is the other Indian species selected, has proved to be somewhat easier. Clearly the fact that *R. gigantea* is prominent via the Tea / Noisette roses in the pedigree of modern roses makes it easier to work with. The clone used in the work was the yellow coloured form raised from seed collected from Manipur (North East India).

R. gigantea is blessed with exceptional vigour. It grows to 50 feet, through trees, in N.E. India and has lovely disease resistant foliage, but the most interesting characteristic of all is the fact that it flowers in peak winter, clearly indicating the possibility of breeding a rose which will freely flower in winter, a feature so urgently required by our cutflower growers.

One of the great pioneers who worked with *R. gigantea* is Fr. Schoener who in the late 1920's and early 30's did a tremendous amount of work in Oregon and California, U.S.A. in collaboration with the Boyce Thomson Institute, New York, and its Director, Dr. Crocker. Fr. Schoener raised 20,000 seedlings from 1200 combinations between *R. gigantea* and well known garden roses. Dr. Crockers's opinion based on these extensive experiments is well worth quoting. He writes in a letter to Fr. Schoener, "I feel that you will have greenhouse roses produced in your crossings that are so much better than any others grown now that there will be no comparison. I have been specially struck by the long conical buds that appear on many of the Gigantea hybrids and the wonderful colouring and texture of the petals. Some of the foliage is wonderful." (American Rose Journal 1932).

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The next step is clearly to backcross these seedlings, as well as the other numerous hybrid progeny which have not yet flowered, with garden roses, to attain true repeat flowering and, hopefully distinctive cut flower roses with an 'India' signature.

Before concluding this section on rose breeding it will be worthwhile to specify what we should look for in these new roses. Clearly *disease resistance, a more acceptable plant habit, and plants of various forms from miniatures to shrubs* would be among the objectives. But the most important objective is surely disease resistance plus beautiful foliage.

About 150 years back, the well known English rosarian, Thomas Rivers talking about *R. bracteata* and it's good qualities, said he hoped that ultimately gardeners would not be satisfied unless all roses had foliage, brilliant and fragrant flowers, and a long season of flowering. This might seem, he said, an extravagant anticipation, but perseverance in breeding would yet achieve wonders.

The prospect of roses with evergreen foliage would appear to be well within the realms of practical possibility. Among the various rose species the following are evergreen or nearly so – *R. clinophylla, R. bracteata, R. sempervirens, R. banksia, R. gigantea, R. laevigata, R. wichuriana.* Apart from beautiful evergreen foliage, these share one very important characteristic - of being species native to the warmer portions of the world. The link between evergreen foliage and warm climate is hopefully very close indeed.

As already noted it is necessary not only to breed better roses for the tropics, but also substantially alter current landscaping use. In today's smaller garden the attempt should be to integrate roses into the garden scene, as exclusive rose gardens are beyond the reach of the average rose gardener.

Many of the older roses do very well in tropical warmth and these can be planted together with various tropical plants which have contrasting plant habits, foliage and flowers. Pleasing associations can be made using ground cover plants of the type of perennial *verbenas,* dwarf spreading *lantanas,* the highly coloured mutants of sweet potato, the various types *of datura, hibiscus* - especially the erect growing smaller flowered kinds, and other shrubs like pentas and the numerous garden plants of the *Acanthacea* provide a wealth of choice. Some of the *acalyphas* - especially the ones with narrow foliage as well as the richly coloured *eranthemums* contrast very well with the paler coloured roses, which could be set off by bulbs like *zephyranthus* and the smaller flowered *hippeastrums* to create a rose garden which looks attractive even when the roses are not in bloom.

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Editors Note : This article is the text of the lecture given at the Asian Regional Rose Convention at Jaipur in January 1999

Copies of the original

Indian Rose Annual 2000

Tropical Rose Breeding - and beyond

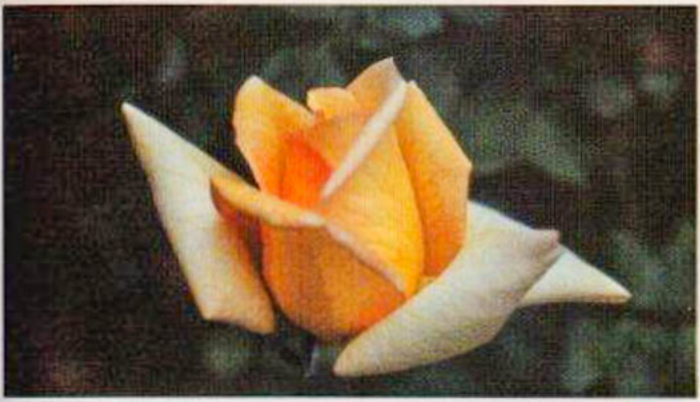
M.S. Viraraghavan

There is little doubt that the rose remains the world's most popular, indeed, romantic flower, but the signs of slippage from the No. 1 position so long taken for granted, are all too evident. With the rise in the popularity of the garden centre, there are a host of other plants available for the home gardener. Again, as a commercial cutflower, the difficulties encountered in India have unfortunately had an adverse effect on cutflower rose growing which in a way provides the commercial backbone for the popularity of the rose.

The status of the rose in home gardens is understandably affected by decreasing garden size as well as increase in shade. Rose experts, especially those of the insular kind tend to depict the rose as an exclusive aristocrat which requires its own space, and no competition from other garden plants. This attitude puts off potential rosarians, especially younger gardeners (on whom surely the future of gardening depends) from attempting roses. The reputation of the rose as a difficult plant which requires constant attention is certainly a factor which influences gardeners at a time when leisure available to tend the garden with both husband and wife working, is steadily getting abbreviated.

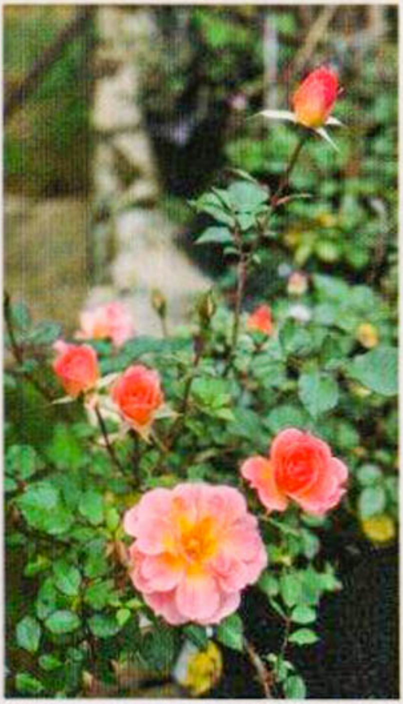
The problem of spraying pesticides, so often (mistakenly?) held out as essential is a very real one, and tending to a small garden, surrounded by neighbours who may not be keen gardeners, becomes tedious. Environmental concerns rightly discourage the use of pesticides. In countries like Germany, where the Green movement is strong, the older award winners have slipped badly in popularity in these days of little spraying. But a factor of special relevance when dealing with roses in tropical and subtropical climates is the competition roses face from other tropical evergreens endowed with lovely foliage which remain attractive throughout the year.

Hillview, Fernhill Road, Kodaikanal - 624 101, Tamil Nadu.



Landora x (Mme Charles Sauvage x R. Clinophylla Seedling)

- M.S. Viraraghavan



Anna Ford x (Bonica x R. Clinophylla x Virmont

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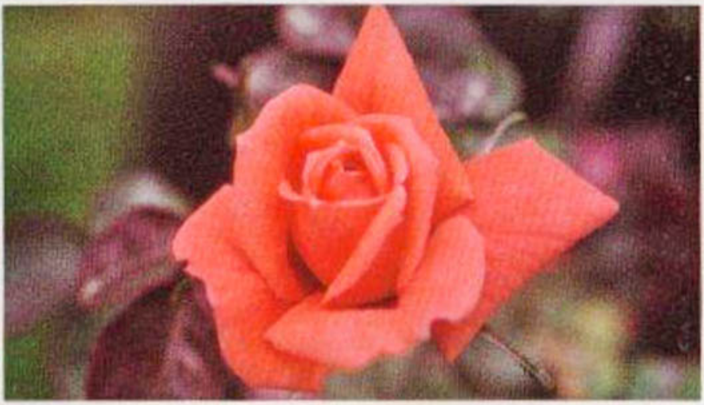

R. clinophylla seedling x New Zealand

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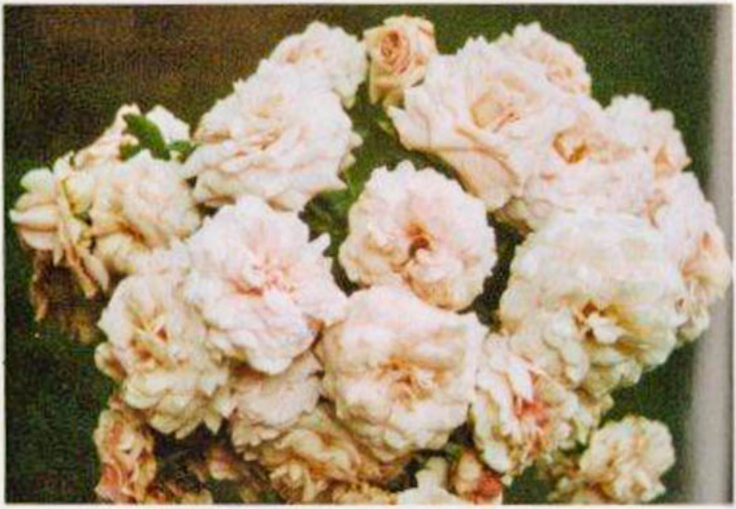

Ahalya x Neelambari - Floribunda

- C.R. Chiplunkar

In the tropics the true test of garden worthiness of a plant is beauty when not in flower, i.e., beauty of foliage and plant habit, in both of which roses come off second-best.

On commercial cutflower growing, a recent study by NABARD [National Bank for Agricultural and Rural Development] has established what a rose breeder could have forecast - that under the climatic conditions prevailing in India's cutflower growing regions, both the yield per unit area, as well as the quality of the flowers does not match Western standards.

While there are several reasons, the most obvious one is the reliance on cutflower varieties developed in the West which do not perform to optimum at our higher temperatures. For example, the average temperature in cutflower growing areas in India is a good 5 degrees C higher than what prevails in the corresponding locations in Israel. Clearly different varieties are required.

A serious additional problem is the need to maximise production during the Western winters when prices are highest. The competition during this time from southern hemisphere countries like Kenya, S. Africa and Colombia, which have the much easier task of maximising production in their summers is difficult to match, while growing the same varieties.

Thus it would seem that whether we consider roses in home gardens or as commercial cut flowers, drastic changes in what roses are grown, and how roses are grown, are both absolutely essential.

India's pioneering hybridiser, B.S. Bhatchaji, while emphasizing that rose growing is for the pleasure of producing beautiful flowers with normal care, pointed out that a separate line of breeding for the tropics is an absolute must.

Rose breeding in temperate climates has rightly concentrated in evolving varieties which stand up to the rigours of winter. Roses raised with this objective can hardly be expected to perform well in our Indian climate where surviving with the ability to produce good blooms in the winter rose season is what is required.

Creating such a line of heat resistant roses is not an easy task by any reckoning, as it carries with it the daunting (!) prospect of consciously reversing the basics of selection underlying Western rose breeding over all these centuries !

What are the strategies for creating such a new line? Basically, one can think of three possible methods.

1. Breeding using heritage roses like *R. Edward* (the original *Bourbon*), Archduke Charles (China), Paul Neyron (Hybrid Perpetual), Cecile Brunner (China) and numerous tea roses which do well in India.

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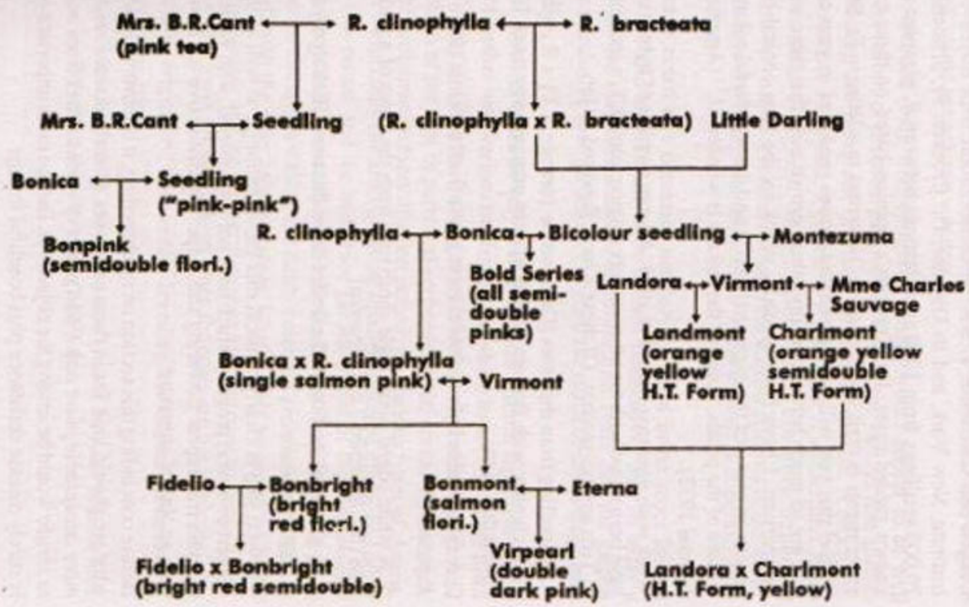
R. clinophylla Hybrids - A Family Tree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R. clinophylla
R. bracteata
Mrs. B.R.Cant
Seedling
(R. clinophylla x R. bracteata)
Little Darling
Bonica
Seedling ("pink-pink")
Bonpink (semidouble flori.)
R. clinophylla
Bonica
Bicolour seedling
Montezuma
Bold Series (all semi-double pinks)
Landora
Virmont
Mme Charles Sauvage
Landmont (orange yellow H.T. Form)
Charlmont (orange yellow semidouble H.T. Form)
Bonica x R. clinophylla (single salmon pink)
Virmont
Fidelio
Bonbright (bright red flori.)
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Eterna
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Landora x Charlmont (H.T. Form, yellow)

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The next step is clearly to backcross these seedlings, as well as the other numerous hybrid progeny which have not yet flowered, with garden roses, to attain true repeat flowering and, hopefully distinctive cut flower roses with an 'India' signature.

Before concluding this section on rosebreeding, it is worthwhile to specify what we should look for in these new roses. Clearly *disease resistance, a more acceptable plant habit,* and *plants of various sizes* from *miniatures to shrubs* would be among the objectives. But the most important objective is surely disease resistance plus beautiful foliage.

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The Indian Rose Annual XVIII - 2002

New Bloodlines for Breeding in the New Millenium with an Emphasis on Warm Climate Rose Breeding

M.S.Viraraghavan

While breeding roses it is of vital importance to bring in fresh genetic input, if substantial results are to be achieved. The case for such an approach has been summarized with admirable brevity by the great rose breeder, Wilhelm Kordes of Germany: “The soup ladle will bring out only what has been put into the tureen”.

A most important corollary is the need to evolve a separate line of breeding for warm climates, which is the point emphasized many years ago (1930’s) by India’s premier hybridizer, B.S.Bhatcharji. Creation of such a line carries with it the daunting (?) implication that we have to consciously reverse the very basis of Western rose breeding with its emphasis on winter hardiness. Warm climate rose breeding has received comparatively little attention in the past – in fact, the great pioneer is Australia’s Alister Clark.

At this stage it is appropriate to consider our objective. TO MY MIND THE MAIN FOCUS HAS TO BE ON THE BEAUTY OF THE ROSE AS A PLANT AND NOT JUST AS A FLOWER. Eminent authorities like Sam McGredy and, several decades earlier, the English rosarian, Thomas Rivers, have stressed the need for roses to be beautiful even when not in flower.

With these objectives, I have begun work with two Indian rose species, *Rosa clinophylla* and *Rosa gigantea* for almost 30 years. *R. clinophylla* which has lovely evergreen foliage and white single flowers is perhaps the only really tropical species in the entire world. Like most species it is once flowering. One form grows with its feet in water on the islands in the river Ganges, another in the incredible dry heat of the Bihar plains, and a third form on a mountain in the Rajasthan desert, Mt. Abu.

Initial crosses with both diploid and tetraploid garden roses have now progressed to where we have healthy repeat flowering seedlings, which hopefully, will be the basis for better garden roses. Three such seedlings have been registered with the International Rose Registration Authority – ‘Ganges Mist’, ‘Silver Dawn’ and ‘Ganges Nymph’.

The genetic gap between *R. clinophylla* and modern roses has been bridged, but whether the genes for heat resistance have been carried forward remains to be seen. However, reports on these roses from areas which are warm, even hot, show promise.

Breeding has also been done following Alister Clark’s lead with *R. gigantea*, using a clone collected in North East India, at Ukhrul in Manipur State. *R. gigantea* possesses tremendous vigour and lovely disease-resistant foliage, justifying Graham Stuart Thomas’s observation that it is the ‘empress of wild roses’.

Starting with the second generation, repeat flowering has appeared and now, in the later generations, there are roses which resemble vigorous modern Hybrid Teas.

What of the future? It is clearly necessary to integrate the two breeding lines, as *R. gigantea*, which is the ancestor of modern roses, will, hopefully, act as a bridge between *R. clinophylla* and modern roses. This integration has taken place and resulted in a seedling which is being used in further breeding. We have to simultaneously bring in other evergreen rose species such as *R. laevigata* and *R. bracteata* in order to further improve rose foliage quality and better petal texture so vital in a warm climate. We should do more work with evergreen species, as the link between warm climate and evergreen species is close indeed – all the evergreen species are natives of the warm parts of the world. Such work is a crucial part of our overall strategy. A really warm climate requires that we hybridise more roses of the Tea / Nosiette strains, that is, at the diploid level. We love the beauty and grace of the old Tea roses, but it is good to remember that increasing the chromosome number will lead to a loss of these characteristics.

These new roses require, apart from better petal texture, an intensified color range, best achieved by bringing in the blood of the diploid yellow roses of China and Afghanistan.

Originality is the name of the game!!

Lest the breeding strategy so far outlined be considered mere speculation, it is necessary to highlight certain observations on which it is based.

CHART I shows the new bloodlines recommended and the characteristics we are looking for as well as the rose species which, it is felt, will provide them.

Taking up **HEAT RESISTANCE**, as already mentioned, the 3 forms of *R. clinophylla* cover the entire gamut of heat resistance from moist heat to dry heat as also dry cold. As far back as 1976 in a path-breaking paper presented to the Royal National Rose Society, (RNRS) U.K. sponsored International Rose Conference, Dr. E. F. Allen, then Scientific Advisor to RNRS, suggested the use of *R. clinophylla* for breeding roses for warm climates of the world, including Queensland. (1)

Coming to **EVERGREEN FOLIAGE** and **DISEASE RESISTANCE,** the **CHART** refers to the use of *R. bracteata* and *R. laevigata*. These two species have also lovely flower petal texture which is an eminently desirable quality in warm areas. *R. bracteata* has great disease resistance. Earlier research at Maryland University, USA, indicated it was essentially immune to all forms of Black Spot disease.(2). But this is now disputed. Under Kodaikanal conditions, it never develops Black Spot or mildew. It is also continuous blooming. More recent research by Dr. A.V. Roberts et al (3) suggests that there are two types of Black Spot resistance – genetic and cuticular – i.e. based on the condition of the leaf surface. Is that of *R. bracteata* of the second kind? Latest research (4) shows the existence of 5 different kinds of Back Spot and that *R. davidii elongate* is the one species completely resistant to all these strains. The modern shrub rose, ‘Baby Love’ the use of which is recommended for further breeding, is derived from *R. davidii elongata*.

On the subject of **PETAL TEXTURE** we should emphasize that one of the chief disadvantages of warm climate adapted roses like the Tea roses, are their extremely thin petal texture. On the Indian plains, a bloom of the variety 'Lady Hillingdon' enchanting at open stage will be bleached out by 10 a.m. in the morning.

No studies seem to have been done on roses to measure their petal thickness, on the lines of the work done with rhododendrons (5). Anyone who has grown *R. laevigata* or *R. bracteata* will testify to their excellent petal texture.

Regarding **VIGOUR** and the need of a bridge to modern roses, there is little doubt that *R. gigantea* is easily the most vigourous of rose species.

If you attempt to hybridise with *R.clinophylla*, the difficulty of bridging the genetic distance between it and modern roses is painfully obvious. So it is logical to bring in R. gigantea, and the recently discovered original Chinese rose, *R. chinensis spontanea*, which is in the background of our modern roses, to simplify the process. To this end, my seedlings of R. gigantea x R. clinophylla, mentioned earlier will, hopefully, make further progress much easier.

Dr. Robert Basye, who has endowed a Chair in Rose Breeding at the Texas A & M University, USA suggested the creation of artificial tetraploids by crossing diploid rose species and doubling their chromosome number with the drug colchicines, so that their chromosome number is raised to that of modern roses, thereby facilitating intercrossing. But this too complicated for amateur rose breeders.

Coming to **COLOUR RANGE,** the great disadvantage with heritage warm climate roses is the absence of yellow pigment. The extraordinary colour range of the modern rose is due to the introduction of the gene for dark yellow colour via *R. foetida* by Pernet Ducher, that great rose breeder of France. Bertram Park, a great rose grower and royal photographer – an unique combination of talents – speculated on how the world of roses would have been entirely different if, instead of the Black Spot addicted *R. foetida*, one of the yellow roses of China had been in bloom and caught Pernet Ducher's eye in the Lyon Park. (6).

Work with these yellow roses of China, which are all diploid and therefore easy to cross with our evergreen species which are also diploid, has been shown to be quite feasible, by the Chinese work done by what is called the Rejuvenation Rose Group. An account of this by Trevor Nottle appears in the Spring 1993 Journal of the Heritage Roses, Australia (7).

Fairly recent work by Prof. C.H. Eugster of Switzerland has shown that carotenoids are widespread in rose species and not confined to *R. foetida* alone as earlier surmised, and that even Tea roses have them but at an earlier stage of formation where the colour intensity is still not patent. Of all the old Tea/Noisette roses it is only 'Fortune's Double Yellow' which has the unique capacity to take the carotenoid synthesis further to provide brighter yellow colours. Hence the suggestion to use this variety in my breeding programme.

CHARTS II and **III** highlight the need to have differing breeding programmes for the extremely warm and the moderately warm climates of the world. The distribution of rose species itself indicates the close link between the chromosome number and the adaptation to climate. While the diploid (2 sets of chromosomes) species are found nearer the Equator, the tetraplod ones (4 sets) exist in more temperate climes, and the octoploid ones (8 sets) in the extreme north near the North Pole. From a horticulturist's angle, we can see that when gardening in a cold climate it is only the Teas/Noisettes of the kind of 'Gloire de Dijon' (tetraploid) or 'Lady Hillingdon' (triploid) which are most successful, unlike the majority of the class which are diploid. The pattern is evident.

On the subject of disease resistance, in addition to 'Baby Love' (derived from *R. davidii elongata*) the use of the recent All America Rose Winner variety, 'Knockout' (with *R. moyesii* in its background) as well as the older shrub rose 'Carefree Beauty' (*R. laxa* in its heritage) seem worthwhile. 'Golden Showers' contributes mildew resistance as was noted long ago by the famous American hybridizer, Dr. W.E.Lammerts (10).

Some of the ideas suggested above have been carried out in my rose breeding work for the past 3 decades, and many of the varieties so derived have been registered with the International Rose Registration Authority.

This is the text of the First Rumsey Memorial lecture given at the 6th Biennial National Rose Conference of the ‘Heritage Roses in Australia, Inc’ 1-4th November 2001, at Hahndorf, near Adelaide, South Australia.

References:

1. E.F. Allen: Rose Breeding (3) Proceedings of the 1976 International Rose Conference reported in the RNRS Annual, U.K. 1977, pg 125
2. Bertram Park: Collins Guide to Roses IVth Ed.1962. pg 178
3. Dr A.V.Roberts et al: Resistance and susceptibility to Blackspot. The Rose Annual 1981, RNRS, Uk, pg 117-121. Mentioned by M.S.Viraraghavan in his article ‘Rose Breeding for the Tropics’ , Indian Rose annual. IX, 1991.
4. Dr. A.V.Roberts et al (2000) Resistance of roses to pathotypes of Diplocarpon rosae. Annals of Applied Biology 136, pgs 15-20. Mentioned in the Canadian Rose Annual 2000.
5. Pat halligan: Corolla thickness of rhododendrons. Journal of the American Rhododendron Society. Vol .338, No. 3, Summer 1984
6. Bertram park: The World of Roses, George G Harrap & Co. Ltd 1962. Introduction Pg 5 para 4, pg 9, para 2.
7. Trevor Nottle: Reporting in The Journal of the Heritage Roses Australia Inc Vol. 15, No.3, Spring 1993. Also in Rejuvenation Rose Group by Dr. Yan-ma pg 79, The American Rose Annual 1994
8. Dr David Leach: Journal of the American Rhododendron Society Winter 1982
9. C.H. Eugster & E. Märki-Fischer: The Chemistry of Rose pigments pg 663 Angewandte Chemie Vol. 30 No. Marka-Fischer 6. June 1991, International

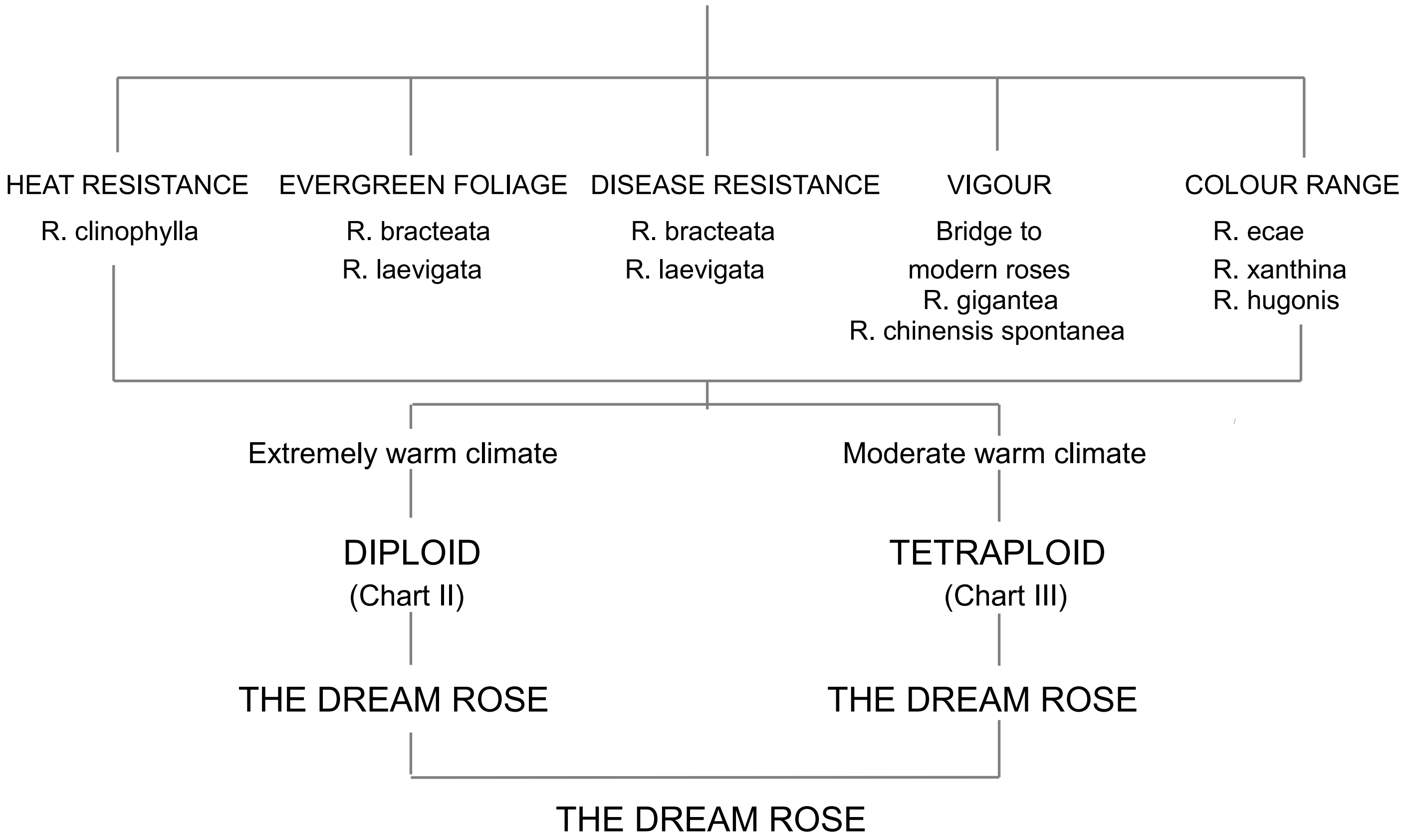
Edition in English

10. Dr. W.E.Lammerts: Hybridising Roses with Immunity.

This is the text of the first Rumsey Memorial Lecture by M.S.Viraraghavan at the 6th Biennial National Rose Conference at the “ Heritage Roses in Australia Inc’ 1st – 4th November 2001 at Hahndorf, near Adelaide, South Australia

CHART I

NEW BLOODLINES



Adapted to warm climate evergreen, shiny, desease resistant foliage
Graceful growth habit, good flower petal texture
Shapes ranging from H.T. form to old rose form
Single and double, wide colour range

CHART II

THE EVERGREEN ROSE
NEW BLOODLINES

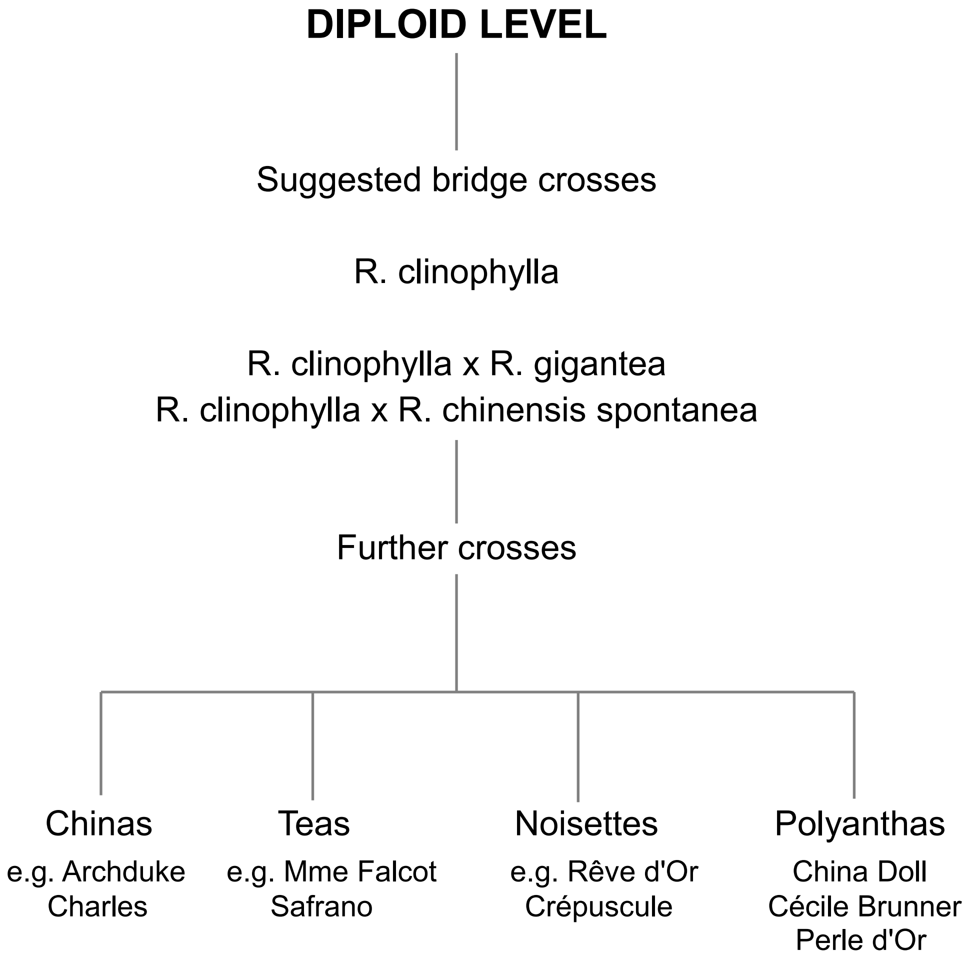
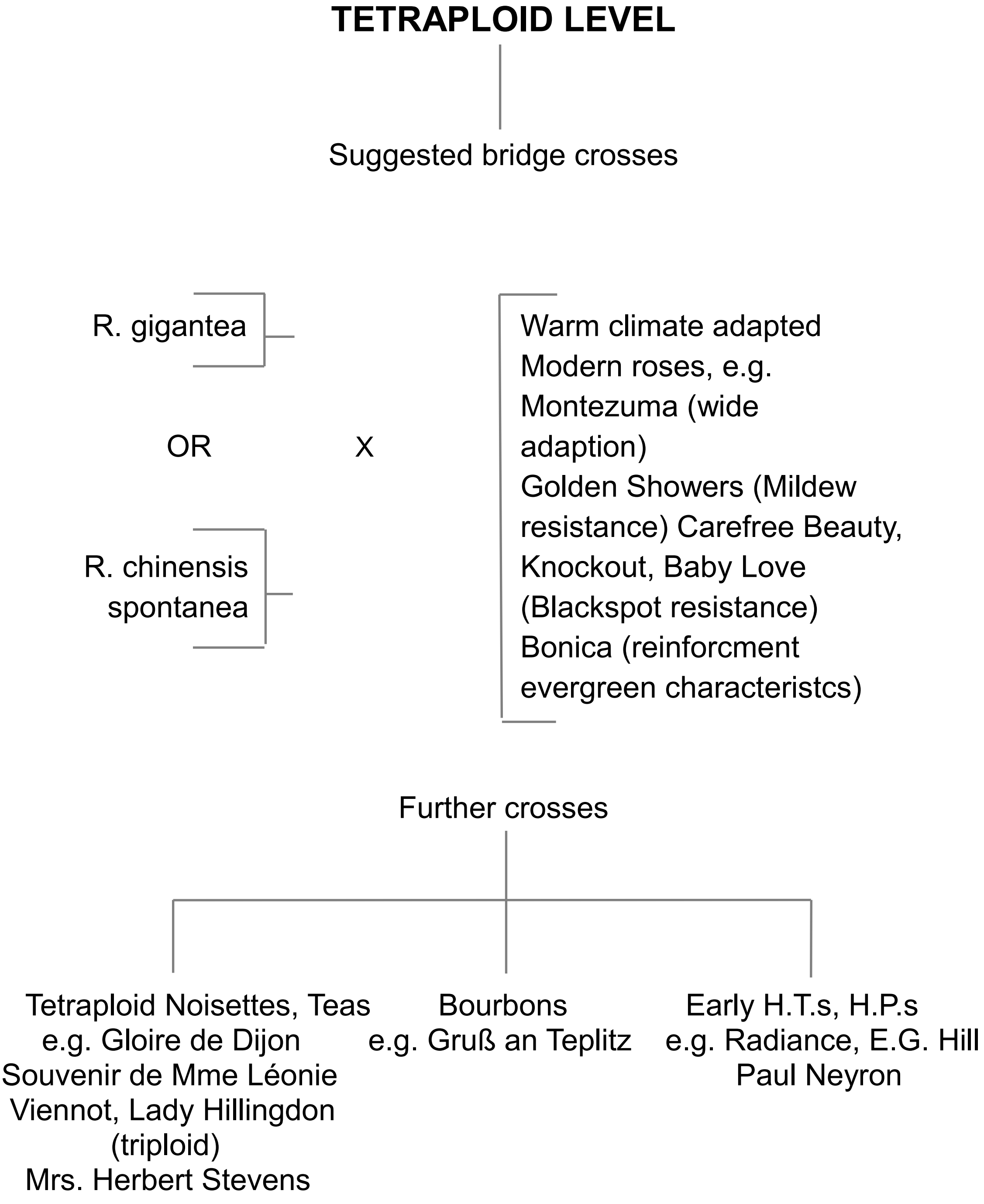


CHART III

THE EVERGREEN ROSE
NEW BLOODLINES



TETRAPLOID LEVEL

Suggested bridge crosses

R. gigantea

OR

R. chinensis spontanea

X

Warm climate adapted Modern roses, e.g. Montezuma (wide adaption) Golden Showers (Mildew resistance) Carefree Beauty, Knockout, Baby Love (Blackspot resistance) Bonica (reinforcment evergreen characteristcs)

Further crosses

Tetraploid Noisettes, Teas
e.g. Gloire de Dijon
Souvenir de Mme Léonie Viennot, Lady Hillingdon (triploid)
Mrs. Herbert Stevens

Bourbons
e.g. Gruß an Teplitz

Early H.T.s, H.P.s
e.g. Radiance, E.G. Hill
Paul Neyron

Copies of the original

Indian Rose Annual 1998

New Bloodlines for Breeding in the New Millennium with an Emphasis on Warm Climate Rose Breeding

M.S. Viraraghavan

While breeding roses for the new millennium it is of vital importance to bring in fresh genetic input, if substantial results are to be achieved. The case for such an approach has been summarized with admirable brevity by the great Wilhelm Kordes : "The soup ladle will bring out only what has been put into the tureen".

A most important corollary is the need to evolve a separate line of breeding for warm climates, which is the point emphasized many years ago (1930's) by India's premier hybridiser, B.S. Bhatcharji. Creation of such a line carries with it the daunting(?) implication that we have to consciously reverse the very basis of western rose breeding with its emphasis on winter hardiness. Warm climate rose breeding has received comparatively little attention in the past - in fact, the great pioneer is Australia's Alister Clark.

At this stage it is appropriate to consider our objectives. TO MY MIND THE MAIN FOCUS HAS TO BE ON THE BEAUTY OF THE ROSE AS A PLANT AND NOT JUST AS A FLOWER. Eminent authorities like Sam McGredy and, several decades earlier, the English rosarian, Thomas Rivers, have stressed the need for roses to be beautiful even when not in flower.

With these objectives, work has been done with two Indian rose species, R. clinophylla and R. gigantea for almost 20 years. R. clinophylla which has lovely evergreen foliage and white single flowers is perhaps the only really tropical species in the entire world. Like most species it is once flowering. One form grows with its feet in water on the islands in

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"Hillview", Fernhill Road, Kodaikanal 624 101, Tamil Nadu
Email : girija-veera@eth.net

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Initial crosses with both diploid and tetraploid garden roses have now progressed to where we have healthy repeat flowering seedlings, which, hopefully will be the basis for better garden roses. The genetic gap between R. clinophylla and modern roses has been bridged, but whether the genes for heat resistance have been carried forward remains to be seen.

Breeding has also been done following Alister Clark's lead with R.gigantea using a clone collected in India's North-east. R.gigantea possesses tremendous vigour and lovely disease resistant foliage, justifying Graham Stuart Thomas' observation that it is the "empress of wild roses".

Starting with the second generation, repeat flowering has appeared and now, in the third generation, there are roses which resemble vigorous modern Hybrid Teas.

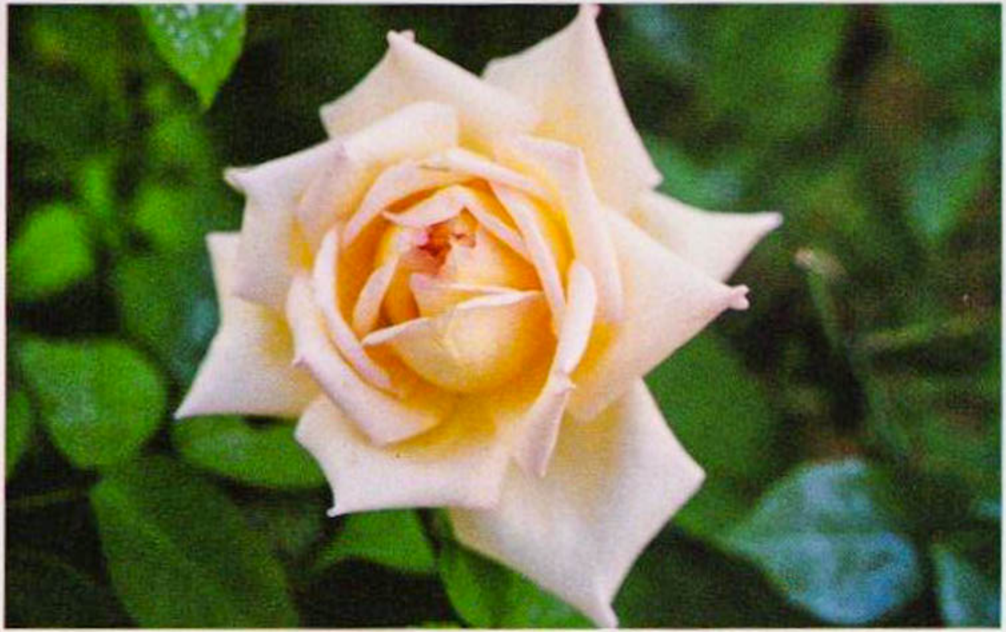
What of the future? It is clearly necessary to integrate the two breeding lines, as R.gigantea, which is an ancestor of modern roses, will hopefully act as a 'bridge' between R. clinophylla and modern roses. We have to simultaneously bring in other evergreen rose species such as R. laevigata and R. bracteata in order to further improve rose foliage quality and better petal texture so vital in a warm climate. We should do more work with evergreen species as the link between warm climate and evergreen rose species is close indeed - all the evergreen species are natives of the warm parts of the world. Such work is a crucial part of our overall strategy. A really warm climate requires that we hybridise more roses of the Tea/Noisette strains, i.e. at the diploid level. We love the beauty and grace of the old Teas, but it is good to remember that increasing the chromosome number will lead to a loss of these characteristics.

These new roses require, apart from better petal texture, an intensified colour range, best achieved by bringing in the blood of the diploid yellow roses of China and Afghanistan.

Originality is the name of the game !!

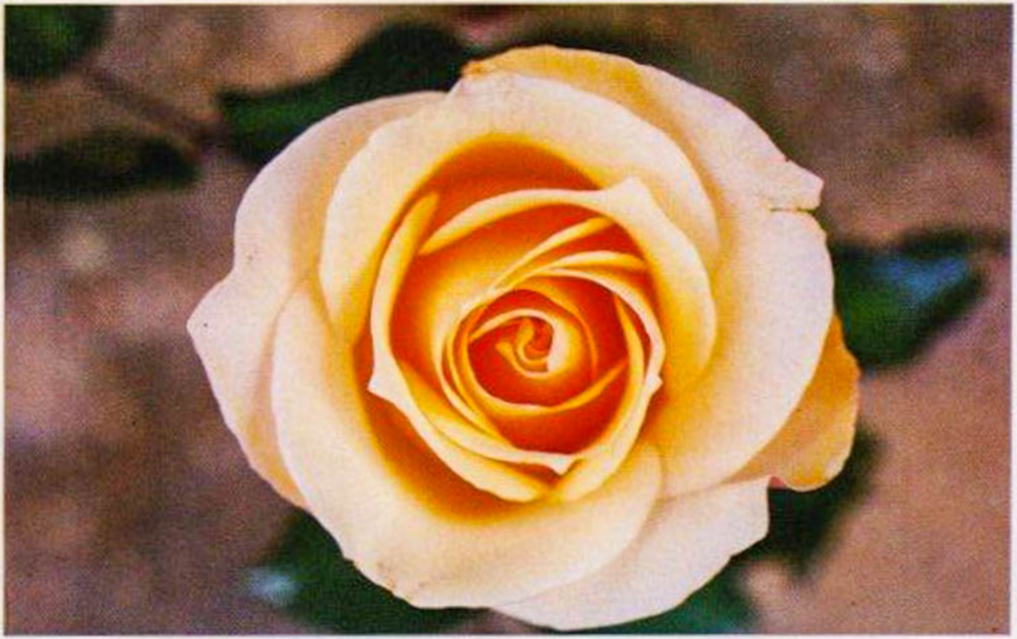
Lest the breeding strategy so far outlined be considered mere speculation, it is necessary to highlight certain observations on which it is based.

Two Beautiful Old Roses



Madame Falcot

Photo Courtesy : M.S. Viraraghavan



Lady Hillingdon

We require new editions of these lovely heritage roses.

Photo Courtesy : M.S. Viraraghavan

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Taking up HEAT RESISTANCE, as already mentioned, the 3 forms of R.clinophylla cover the entire gamut of heat resistance from moist heat to dry heat as also dry cold. As far back as 1976 in a pathbreaking paper presented at an R.N.R.S sponsored International Rose Conference, E.F. Allen, then Scientific Advisor to RNRS suggested the use of R.clinophylla for breeding roses for warm climates of the world, including Queensland. (1)

Coming to EVERGREEN FOLIAGE and DISEASE RESISTANCE, the Chart refers to the use of R. bracteata and R. laevigata. These two species also have lovely petal texture which is an eminently desirable quality in warm areas. R. bracteata has great disease resistance. Earlier research at Maryland University, USA indicated it was essentially immune to all forms of Blackspot. (2). But this is now disputed. Under Kodaikanal conditions where I live, it never develops Blackspot or mildew. It is also continuous blooming. More recent research by Dr. A.V. Roberts et al (3) suggests that there are 2 types of Blackspot resistance - genetic and cuticular i.e. based on the condition of the leaf surface. Is that of R. bracteata the second kind? Latest research (4) shows the existence of 5 different kinds of Blackspot and that R. davidii elongata is the one species completely resistant to all these strains. The modern shrub, Baby Love, the use of which is recommended for further breeding, is derived from R. davidii elongata.

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On the subject of disease resistance, in addition to Baby Love (derived from R. davidii elongata), the use of the recent AARS winner, Knockout (with R. moyesii in its background) as well as the older shrub rose, Carefree Beauty (R. laxa in its heritage) seem worthwhile, Golden Showers contributes mildew resistance as was noted long ago by the famous American hybridiser, Dr. W.E. Lammerts. (10)

Some of the ideas suggested above have been carried out in my rose breeding work for the past 2 decades.

Reference :

1. E.F. Allen : Rose Breeding (3) Proceedings of the 1976 International Rose Conference reported in the R.N.R.S. Annual. U.K. 1977, pg 125.
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9. C.H. Eugster & Edith : The Chemistry of rose pigments. pg 663 Angewandte Chemie Vol. 30 No Marka-Fisher 6, June 1991, International edition in English.
10. Dr. W.E. Lammerts : Hybridising Roses with Immunity.

CHART I

NEW BLOODLINES

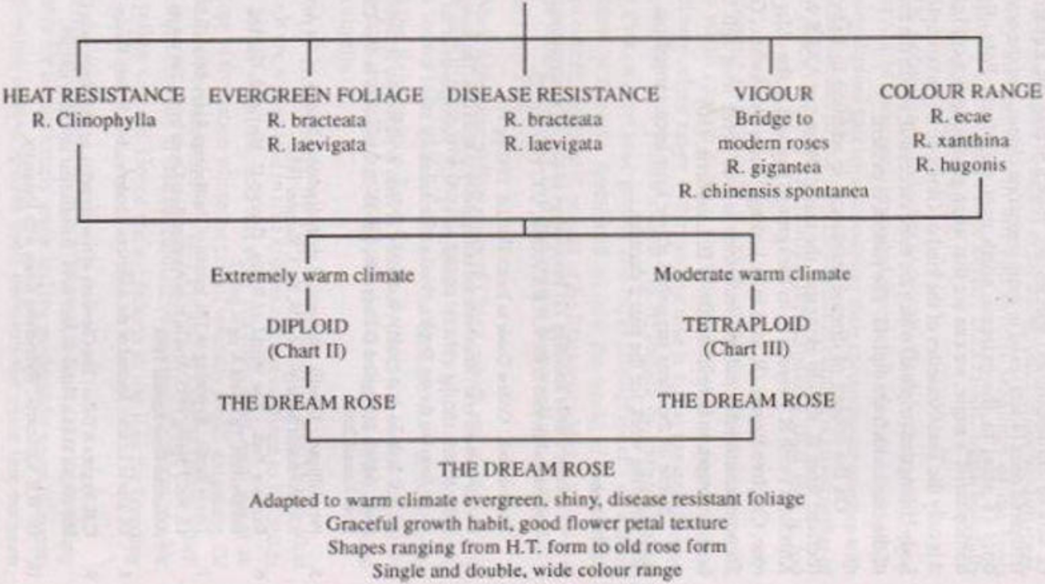


CHART II

THE EVERGREEN ROSE

NEW BLOODLINES

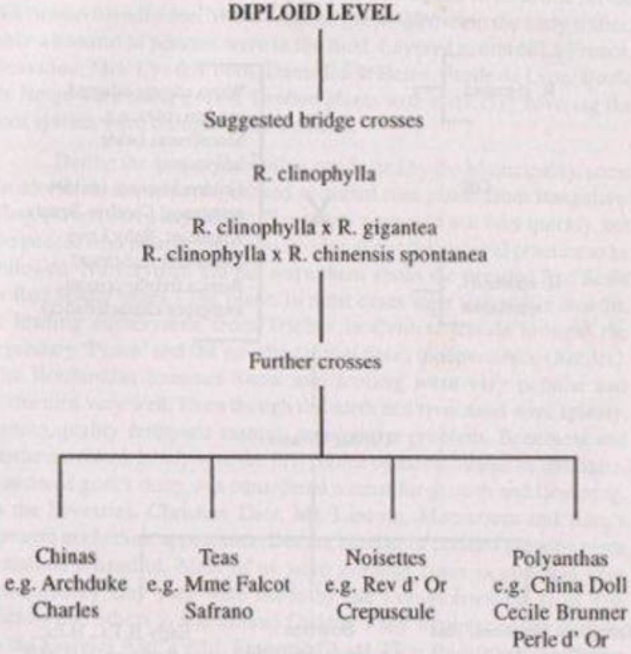
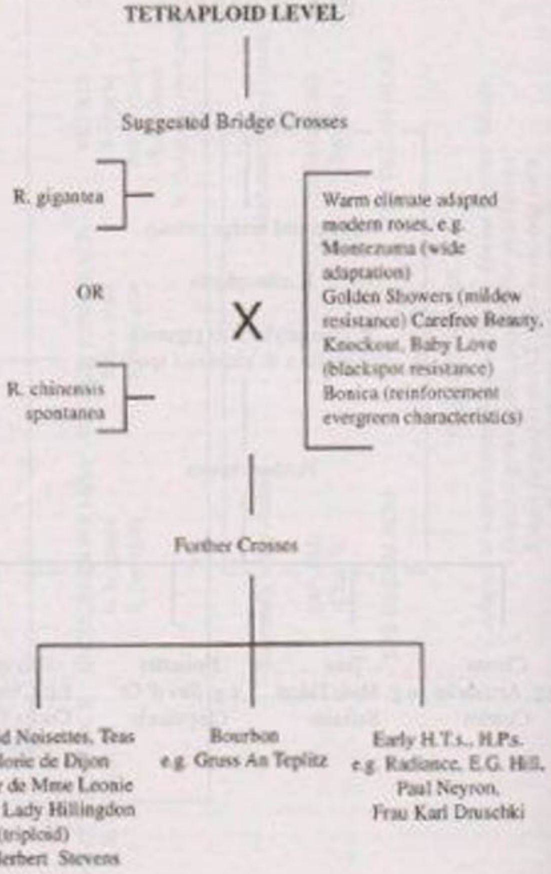


CHART III

THE EVERGREEN ROSE
NEW BLOODLINES


TETRAPLOID LEVEL
Suggested Bridge Crosses
R. gigantea
OR
R. chinensis spontanea
X
Warm climate adapted modern roses, e.g. Montezuma (wide adaptation) Golden Showers (mildew resistance) Carefree Beauty, Knockout, Baby Love (blackspot resistance) Bonica (reinforcement evergreen characteristics)
Further Crosses
Tetraploid Noisettes, Teas e.g Glorie de Dijon Souvenir de Mme Leonie Viennot, Lady Hillingdon (triploid) Mrs. Herbert Stevens
Bourbon e.g. Gruss An Teplitz
Early H.T.s., H.P.s. e.g. Radiance, E.G. Hill, Paul Neyron, Frau Karl Druschki

Indian Rose Annual - IRA 2002

Roses in the Gardens of New Zealand and Australia

M. S. Viraraghavan and Girija Viraraghavan

David Ruston, one of Australia’s, and indeed the world’s, great rosarians as well as a flower arranger par excellence is fond of exclaiming “it is magic” when excited at seeing a beautiful rose or garden scene. We can think of no better word to describe the gardens of New Zealand and Australia, creations of fascinating beauty and perfection equalling, if not surpassing the more publicized gardens of Western Europe and USA.

Our visits to so many outstanding gardens organized by various Heritage Rose groups and Rhododendron Associations in the two countries, was the experience of a lifetime. It is difficult to do justice to the extraordinary diversity of these gardens or the remarkable enthusiasm and kindness with which we were shown around. But we will try.

Our introduction to the rose gardens of the Antipodes was, appropriately, with the Nancy Steen Heritage Rose Garden in Auckland, New Zealand. The late Nancy Steen was responsible for reviving the interest in heritage roses – roses that have stood the test of time – in New Zealand. Her book, “The Charm of Old Roses” is a ‘must read’ for every rosarian. This garden, opened in 1984, has over 200 old-fashioned and specie roses, laid out in the inimitable style popularized by her. We were a bit early, but were delighted with 'Nur Mahal' (dark coloured Hybrid Musk), the enchanting pink and yellow climbing Tea rose, 'Souvenir de Madame Leonie Viennot', 'Lady Hillingdon' and 'Cecile Brunner' (China polyantha). A semicircular white garden full of white roses and other plants demarcated one side of this fascinating place.

The next garden our Auckland hosts, Margaret and John Meyer took us to, was “Woodbridge” owned by a charming couple, Christine and Tony Peek. It was difficult to believe that their beautiful 10 acre country garden was hardly 10 years old. The colour coordination of plants with grey and silver foliage progressing to shades of blue and culminating in a grove of ash green olive trees approached through a path lined with lilac and grey lavender bushes showed that much thought had gone into the planning of the garden. The wealth of roses included a rare single yellow banksia (see Helga Brichet’s article in this annual), the creamy yellow rambler Alberic Barbier growing profusely on a long screen, the salmon hybrid musk, Cornelia, 'Buff Beauty' (creamy yellow) and 'Sally Holmes' (cream). In the H.T. range we had the distinctive pale brown 'Julia’s Rose' and McGredy’s 'Auckland Metro' (white). 'Crepuscule' (apricot Noisette), 'Old Blush' (pink China) and the colour changing 'Mutabilis' were some of the other roses which drew the eye. The large water garden in front of the house was imaginatively landscaped with many rare plants.

“Ayrlies” is again a country garden described as “a garden for all seasons”. It is incredible that such a huge garden could be so well managed by just two gardeners, supplemented by the owner, Beverley McConnell – a real tribute to the enthusiasm and dedication of the New Zealand gardener. Exquisite combinations of plants, lovely water gardens, a ‘clear as glass’ waterfall, streams and bog gardens made this an unique garden. Under the shade of the tree lined slopes leading to the largest of the water gardens were rhododendrons in full bloom, set off by cymbidium orchids. Ayrlies range of roses included 'Leonie Viennot', 'Devonienses', 'Mrs. B.R. Cant', 'Mrs Herbert Stevens', 'Buff Beauty' and two seedlings therefrom. The climbing China, 'Pompon de Paris' grew up an arch. (see photograph). We felt nostalgic at seeing Bignonia (pyrostegia) Venusta, and the blue petrea climbing the walls of the low rambling house.

These were some of the gardens of the North Island we saw, which housed roses among other plants. We saw many other gardens which had mainly rhododendrons (though always with companion plantings) on our way to a rhododendron convention in New Plymouth. One such was John and Jill Burns near Dannevirke, where a plant of 'Amy Johnson' (Alister Clark) was in splendid bloom (see photograph). We travelled by ferry - a rather stormy crossing over Cooke Strait - to New Zealand’s South Island where we had the privilege of staying with our good friends Sally and Bey Allison. Sally is one of the world’s authorities on heritage roses, the author of several books and a much sought after speaker at the international level. Her “Lyddington Garden”, near Christchurch, spread over more than 10 acres, has literally every variety of rose species, heritage roses as also a careful selection of moderns. Though the season was a bit early for roses, we were fascinated by the way in which they were displayed - in large island beds, in winding, meandering beds, in arches, in pergolas, as standards and on fences and, best of all, in a huge octagonal rose bower, built for Sally by Bey and their son Jonathan. We were delighted to see an enormous sprawling bush of one of the Stud Chinas – 'Park’s Yellow Tea Scented China' - in full bloom (see photograph and Dr. Kalyan Chakraborty”s article in Indian Rose Annual XI). The golden Chinese species, *R. xanthina* 'Canary Bird' and 'Archduke Joseph' (pink Tea) were also in good bloom. It is sad that we don’t have the latter variety in India. It is impossible to do justice to a garden planted so extensively with such an unbelievable variety of roses, each lovingly tended and combined with appropriate companion plants. Verily a garden for the connoisseur.

Sally took us to “Brackenbank” - her friend Helen Russell’s garden. You can understand our excitement at seeing the Alister Clark gigantea hybrids – 'Nancy Hayward' and 'Lorraine Lee' (both in shades of pink) in full bloom as well as a superlative specimen of the only yellow rugosa, 'Agnes'. The single shrub rose 'Golden Wings', 'Maréchal Niel' (the yellow Noisette we all know) and 'Tausendschön' (the polyantha 'Echo' is its sport) were also in good bloom. As elsewhere we were early, but we could envisage the marvelous spectacle this garden would present a few weeks later.

“Little Rose Gardens” at Cust, near Sally’s, had over 1200 varieties in 2 acres of garden – oldfashioneds, Austins, patios, miniatures and species, all grown to an acme of perfection and displayed with skill. We regretted that we did not have a video camera to record how a nursery can be – to show it as a role model for Indian nurserymen!!

Our friends, Kathryn and Geoff Millar, who took us to many rhododendron parks and gardens, were keen to show us “Ohinetahi”, the garden of a wellknown architect, Sir Miles Warren, near Christchurch. This was a garden in an entirely different mood-graciously formal with enclosures of pleached hornbeam trees. A dark red, almost black climbing Hybrid Tea, 'Birthday Present' climbed up a gazebo, many climbers grew up the verandah pillars, more formal rose beds surrounded the ornate house, and a spectacular planting of proteas from South Africa completed the picture. A highly sophisticated garden.

Moving over to Australia, the first garden we saw was appropriately enough the Rumsey Rose Garden at Parramatta, near Sydney. Appropriate because Viru was to give the first Rumsey Memorial Lecture at the Australian Heritage Conference at Hahndorf , in the Adelaide Hills. This garden, designed to reflect the interests of Roy and Heather

Rumsey in specie and heritage roses, had over 500 varieties. The China rose, 'Mutabilis' was impressive, with its fascinating colour changing habit - from pale orange and yellow to coppery pink to almost crimson as the flowers age, which feature has been carried forward in modern floribundas like 'Masquerade'. It is disappointing that 'Mutabilis' is not available in India though it would do well in our climates. The Noisettes, 'Lamarque' (white) and 'Crepuscule' were in good bloom The fragrant white flowered 'Himalayan musk rose', *R. brunonii* was in tremendous bloom, as also many of the Teas – 'Rosette Delizy' (yellow and pink), 'Duchess du Brabant' (pale pink), 'Sombreuil' (white), 'Maman Cochet', 'Gloire de Dijon' (buff yellow), and the Hybrid Musks, 'Cornelia' and 'Felicia'. A very fitting memorial indeed.

The Heritage Rose Conference included visits to many rose gardens in the Adelaide area. The first one, “Cedars” (so named because of the many Himalayan cedars-deodars -planted) was the long time residence of one of Australia’s most famous artists – Hans Heysen. The house, studio and garden are lovingly maintained by the Heysen family. Laid out in cottage garden style, the Bourbon, vSouvenir de la Malmaisonv (called 'Lavanir' in India) was of special note, as this clone avoided the problem common to this variety - of refusing to open in damp weather. Tall foxglove spikes and peony poppies were some of the other plants which set off the roses. A pink single rose, one of Alister Clark’s unidentified ones was looking particularly beautiful.

At the Mt. Lofty Botanic Gardens nearby we observed a very carefully maintained selection of rose species, tended by horticulturist Tina Miljanovic, including the form of *R. gigantea* from Manipur (raised from seed sent by us sometime ago).The golden species, *R. foetida* (seen in Kashmir as also Western Asia), banksian roses and the heritage roses, 'Lady Hillingdon' (apricot) and 'Leonie Viennot' were full of flower.

Very different in approach were the plantings in Gail Barth and David Cartwright’s garden with its extensive collection of herbs, Mediterranean shrubs (like cistus), iris and 200 specie and heritage roses. The charm of the garden was enhanced by its immaculate maintenance and the skilful groupings – gallicas, albas and bourbons together in beds, climbers on arbours, fences and house and outbuilding walls, and individual beds of hybrid musks, chinas, teas, hybrid perpetuals and species – clearly the result of Gail’s experience as a horticultural scientist for many years.

A splendid garden was that of Jaensch and Stokes, and even the heavy rain did not deter us – a spectacular entrance arch with the red rambler 'Bloomfield Courage' and 'Clg. Peace' (see photograph) set the tone for the rest of the garden which had a superb collection of roses complemented by herbs, poppies, iris and other annuals – larkspur, marigold, nigella (love in the mist) to name a few. The bourbon, 'Mme Isaac Pereire' in deepest carmine bordered the verandah which had the orange climber 'Westerland', 'Renée' (pale pink) and that great rose of yesteryear, 'Ophelia' (which is in the background of many modern roses) climbing up its pillars. It was a revelation to learn that all this beauty had been achieved with basic organic methods and following the principles of ‘no dig’ cultivation, i.e. planting on a mixture of pea straw, and farmyard manure with lots of gypsum to lighten the hard clay below. No spraying is done. We have much to learn from this.

The next garden was equally marvelous - Al-Ru Farm extends over 5 acres and here too the problems of stone and hard clay soil have been tackled by using lots of mulch and cowdung manure. Rich coloured peony poppies were used with gay abandon everywhere. An arch of that modern rose with an oldfashioned look, 'Pierre de Ronsard' (pink and white) was the entrance to the main plantings of modern roses. 'Crepuscule' (apricot) and tall red sprays of *R. moyesii* made a striking combination. The Tea roses, 'Monsieur Tillier' and 'Archduke Joseph' led to a lovely White Garden which had 'Clg. Devoniensis' and 'Lamarque'. Many unusual plants like the dragonlily (a close relative of the arisaemas) were used as companion plants.

We drove on to Chateau Barrosa, which is described as a “celebration of horticulture, architecture, music, theatre, wine and roses“. It was difficult to believe that we were in the 21st century in the midst of such medieval splendour created by the immense chateau with its exquisite period furniture, crystal, china and other artifacts. An exciting display of wines, a wine museum and wine-tasting preceded our stroll through the rose garden - an amazing 25 acres of over 20,000 roses. No expense had been spared to make this rosarium one of the world’s great gardens, with all the well known hybridisers represented by enormous plantings of their varieties – Meilland, Dickson, McGredy, Harkness, Tantau, Poulsen, Fryer and of course Australia's own Alister Clark. One of our conference friends, Lilia Weatherly, a breeder from Tasmania was delighted to see a bed of her variety, 'Pink Iceberg'. (see photograph). An innovative planting scheme had a perfumed rose bed, a nostalgia bed, a seduction lawn (roses with risqué names), and a tippler’s bed (with 'Whisky', 'Brandy', etc)!!!. Altogether a rose garden fit for a queen – in fact the Queen of England was scheduled to formally open this garden in early October but the events of September 11th made her cancel her Australian visit.

Our next port of call was the paradise created by David Ruston at Renmark. This is Australia’s, and perhaps the world’s, largest rose garden with more than 50,000 bushes of 4000 varieties. Every type of rose was to be seen – H.T’s, floribundas, climbers, miniatures and an assortment of oldfashioneds – gallicas, damasks, centifolias, mosses, bourbons, teas, noisettes, hybrid perpetuals, musks and rugosas. This incredible collection was set off by the many ornamental trees – cottonwood, red oak, magnolia, redwood, willow, ash, elm, as also flowering peach, pear, apple, plum, apricot, cherry and hawthorn. Further enhancing the impact were the swathes of iris, daylilies, watsonias, crinums, agapanthus and clivias. A Viewing Tower in the center of all this glory gave one a panoramic view of the entire garden. But the most amazing feature of all was the great man himself who knew and loved every one of the 4000 roses. Charming, knowledgeable and willing to share this knowledge with anyone interested, he personally looks after the irrigation of his vast domain, and with the aid of just a few helpers, picks and packs the rose flowers everyday for his nursery business and makes floral arrangements, big and small, for every variety of function, from weddings to funerals. More power to his elbow!

A very distinguished rose garden was that attached to Urrbrae House (in the foothills, south east of Adelaide) The garden has been planned to trace the history and development of roses from just before when the house was built - 1891. The present garden owes much to the efforts of the South Australia Chapter of the Heritage Roses of Australia. The Entrance Walk, a semi-circular path nearly 100 feet long is bordered with that lovely China, 'Cecile Brunner'. Many old teas – 'Betty Uprichard', 'Golden Dawn', 'Comtesse Vandal', 'Crimson Glory', 'Clg. Hadley' and 'Talisman' were grown well. An extensive pergola had, among others, 'Golden Showers' and 'Bloomfield Courage'. A bank of David Austin’s 'Dapple Dawn' with pink single flowers in profusion made a charming sight.

The closing function of the conference was held in the display garden attached to Ross Roses. A steep slope leading to a level area was landscaped with roses from the most modern to the oldies – a treat for the eyes - and every plant grown to perfection and in full bloom. A long pergola of climbing roses, including the shell pink 'Belle Portugaise' and Alister Clark’s 'Lorraine Lee' made a gay picture (see photograph) as did the many beds of Tea roses.

In Adelaide itself we visited two public gardens – the North Bank Heritage Rose Garden and the Adelaide International Rose Garden. The North Bank garden is located on the banks of the River Torrens and is comparatively new – since 1996. It has a fine heritage rose collection grown under the aegis of the Heritage Rose Group. The Adelaide International Rose Garden, part of the Botanic Garden is an exciting place with extensive displays of every kind of rose (see photograph) and charmingly framed by a curving hedge of the bright red climber, 'Dortmund'. The scientific arrangement into various classes as also the excellent standard of cultivation was both an educative and aesthetic experience.

After the close of the Heritage Conference we were the guests of the South Australia Rose Society, staying with Wendy and Merv Trimper. Merv is currently President of the Society. Their garden was a blaze of colour with many modern roses grown to a peak of perfection – all cars driving down their road stopped to admire the unbelievable display.

The climber 'Gold Bunny' was in stupendous form as also the McGredy raised red 'Dublin Bay' covering the garage wall. The focal point in the front garden was (once again) 'Bloomfield Courage' trained with the utmost skill as a weeping standard. We had caught the garden at its best - a few days hence was their Open Weekend when it would be opened to the public.

Another garden, lovingly tended in the cottage garden style was that of Pat and Roy Wilhelm. This garden overwhelmed you not with bright colour but with exquisite shadings of form and texture, of roses and companion plants, in pastel shades, ranging from short clumps to tall spired delphiniums. Pat informed us that the magnificent show was due to systematic mulching with manure without disturbing the soil.

From Adelaide our itinerary took us to Melbourne – the home of Alister Clark who, as we said earlier, hybridized with *R. gigantea* and therefore of special interest for us. We were keen to see as many of his roses as possible and in this endeavour we were ably helped by our hosts, Margaret and Tom Roberts and their son David. They cleverly devised a plan of action whereby we visited all Clark-related gardens in the space of a few days. Starting with the Royal Botanic Garden which has an interesting specie collection, including the ‘gooseberry’ rose – *R. stellata* var. *mirifica*, we next visited old rose enthusiast Diana Fickling’s garden at Waverley. Her 'Francesca' (hybrid musk) was covered with flowers, as were many David Austin roses and Alister Clarks. Again, the combinations of roses in pastel colours were particularly appealing. (see photograph).

Victoria State Rose Garden at Werribee Park is beautifully landscaped. We visited it just after the Australian bred roses section had been opened and these made a glorious spectacle. A 400 metres long curving heritage rose border with 250 varieties encircled the Tudor rose design shaped beds of David Austin’s English roses, modern H.T’s, floribundas and climbers. The rows of standard and half standard roses were immaculate - the floribunda 'Brass Band' (apricot yellow) being a prime example. This huge garden is exclusively managed by the Victoria State Rose Garden Supporters, Werribee Park, a keen volunteer group. (See Bengal Rose Society’s book, “Beautiful Rose Gardens Around the World“ for more details)

We asked the two volunteers, Len Broadstock and Wal Johnston who showed us around, their favourite roses. Len’s were 'Freisia', 'Rebell' (Kordes 1998), 'Elina' (Dickson) and Bridal Pink. Wal’s list had Red Cedar (H.T., Kordes1981, known here as Burgund), 'Pakeha' (cream H.T. of Australian breeder George Dawson), 'Rebell', 'Peacekeeper' (Harkness) and 'Elina'.

The search for more information on Clark roses led us to John Nieuwesteeg and his nursery, which was on the grand scale and being readied for Open Weekend. Despite being very busy, John took us around the display garden and especially his Alister Clark collection. When asked about his favourites, he enumerated 'Graham Thomas' (David Austin), 'Mr. Lincoln', 'Apricot Nectar', 'Elina', 'Diamond Jubilee', 'Peter Frankenfeld', 'Blue Moon' and 'Lady Huntingfield' (Alister Clark yellow H.T.).

Margaret and Tom took us next to Laurie Newman’s “Reliable Roses” nursery which is large and run almost single-handedly by him. He showed us a rose introduced by him and named 'Alister Clark' - a sport of a Clark rose, 'Marjorie Palmer'. Laurie liked the roses bred by the English hybridiser, LeGrice, who bred unusual coloured roses. We saw his 'Vesper' (orange brown) and 'Jocelyn' (dark reddish chocolate). Laurie’s list of favourites includedm'Pristine', 'My Choice', 'Tatiana', 'Honor' and 'The Doctor'. Laurie has India connections - his wife had emigrated from Kanpur/Lucknow.

We had to see the suburb of Bulla, where Clark's ancestral house Glenara is situated.The local municipal council and a band of enthusiastic volunteers led by Tid Alston, whose parents were close friends of the Clark family, have created a charming little jewel of a garden - the Alister Clark Memorial Garden. Many of the ‘lost’ Clark roses were refound in Tid's garden and have been planted here. 'Golden Vision' (*R. gigantea* x 'Maréchal Niel), 'Nancy Hayward', 'Lady Huntingfield', 'Squatter’s Dream' (clear yellow single gigantea shrub) 'Milkmaid', and many others, all carefully tended, are beautifully set off by edgings of shorter Clark roses, (like 'Borderer', salmon pink) lavender and heuchera (a dwarf perennial with sprays of white, pink or red flowers).

From Bulla we drove quite a distance through what was earlier ‘gold country’ – prosperous in the Gold Rush era, now abandoned and forlorn. But we saw a real rose gold mine in the nursery “Hilltop”, run by Ian Huxley, which has a different sort of climate - very dry, frosts in winter, heat-waves in summer. This hillside garden was in fantastic bloom, the Tea/Noisettes being particularly profuse - 'Cloth of Gold' (yellow) and 'William Allan Richardsonv (apricot) . Sadly this latter variety which at one time grew in India is no longer available. *R. wilmotii* and *R. watsoniana*, a variant of multiflora with very different foliage were also notable.

Looking back, we are repeatedly amazed - and inspired - by the many rose gardens we had the pleasure of seeing. What marvelous results have been achieved with little help, but much enthusiasm, even in climates with very low rainfall. South Australia gets hardly 15 inches of rain in a year!!

The outstanding feature of all the gardens was the readiness to grow a wide range of roses as well as the aesthetic integration of roses into the general garden scene. There was hardly a garden where the roses were arranged in melancholy, stiff geometric formations as is the fashion in our country. Everywhere the use of roses as standards, as arches and climbers so that both horizontal and vertical aspects were taken into consideration, added greatly to the visual impact.

For the photographs see the “Copies of the original“ below!

Copies of the original

Indian Rose Annual 2002

Roses in the Gardens of New Zealand and Australia

M.S. Viraraghavan and Girija Viraraghavan

David Ruston, one of Australia's, and indeed the world's, great rosarians, as well as a flower arranger par excellence is fond of exclaiming, "It is magic" when excited at seeing a beautiful rose or garden scene. We can think of no better world to describe the gardens of New Zealand and Australia, creations of fascinating beauty and perfection equalling, if not surpassing the more publicized gardens of Western Europe and USA.

Our visits to so many outstanding gardens organized by various Heritage Rose groups and Rhododendron Associations in the two countries was the experience of a lifetime. It is difficult to do justice to the extraordinary diversity of these gardens or the remarkable enthusiasm and kindness with which we were shown around. But we will try.

Our introduction to the rose gardens of the Antipodes was, appropriately, with the Nancy Steen Heritage Rose Garden in Auckland, New Zealand. The late Nancy Steen was responsible for reviving the interest in heritage roses - roses that have stood the test of time - in New Zealand. Her book, "The Charm of Old Roses" is a 'must read' for every rosarian. This garden, opened in 1984, has over 200 oldfashioned and specie roses, laid out in the inimitable style popularized by her. We were a bit early, but were delighted with Nur Mahal (dark coloured Hybrid Musk), the enchanting pink and yellow climbing Tea rose, Souvenir de Madame Leonie Viennot, Lady Hillingdon and Cecile Brunner (China polyantha). A semicircular white garden full of white and other plants demarcated one side of this fascinating place.

The next garden our Auckland hosts, Margaret and John Meyer took us to was "Woodbridge" owned by a charming couple, Christine and Tony Peek. It was difficult to believe that their beautiful 10 acre country garden was hardly 10 years old. The colour coordination of plants with grey and silver foliage progressing to shades of blue and culminating in a grove of ash green olive trees approached through a path lined with lilac and grey lavender bushes showed that much thought had gone into the planning of the garden. The wealth of roses included a rare single yellow banksia (see Helga Brichet's article in this annual), the creamy

Climbing Pompon de Paris at "Ayrlies", near Auckland, New Zealand.

Park's Yellow Tea-scented China at Sally Allison's Lyddington garden, near Christchurch, New Zealand

Photos Courtesy : M.S. Viraraghavan

Jill Burns in front of the climbing rose Amy Johnson (Alister Clark) at her house in Dannevirke, New Zealand.

Clg. Peace and rambler Bloomfield Courage at Jaensch & Stokes Garden, near Adelaide, South Australia.

Photos Courtesy : M.S. Viraraghavan

yellow rambler Alberic Barbier growing profusely on a long screen, the salmon Hybrid Musk, Cornelia, Buff Beauty (creamy yellow) and Sally Holmes (cream). In the H.T. range we had the distinctive pale brown Julia's Rose and McGredy's Auckland Metro (white). Crepuscule (apricot Noisette), Old Blush (pink China) and the colour changing Mutabilis were some of the other roses which drew the eye. The large water garden in front of the house was imaginatively landscaped with many rare plants.

"Ayrlies" is again a country garden described as "a garden for all seasons". It is incredible that such a huge garden could be so well managed by just two gardeners, supplemented by the owner, Beverley McConnell - a real tribute to the enthusiasm and dedication of the New Zealand gardener. Exquisite combinations of plants, lovely water gardens, a 'clear as glass' waterfall, streams and bog gardens made this an unique garden. Under the shade of the tree lined slopes leading to the largest of the water gardens were rhododendrons in full bloom, set off by cymbidium orchids. Ayrlies range of roses included Leonie Viennot, Devonienses, Mrs. B.R. Cant, Mrs. Herbert Stevens, Buff Beauty and two seedlings therefrom. The climbing China, Pompon de Paris grew up an arch. (See photograph). We felt nostalgic at seeing Bignonia (pyrostegia) Venusta, and the blue Petrea climbing the walls of the low rambling house.

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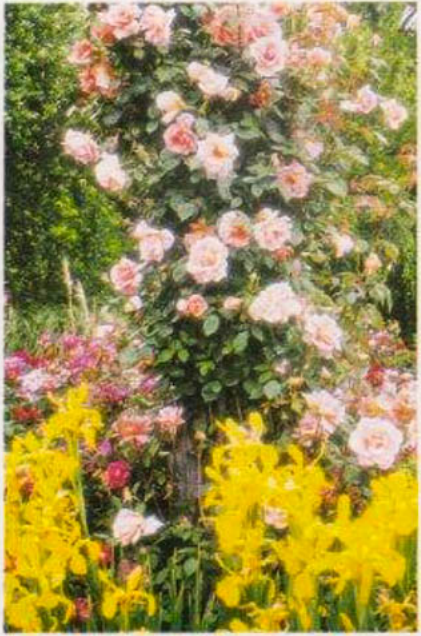
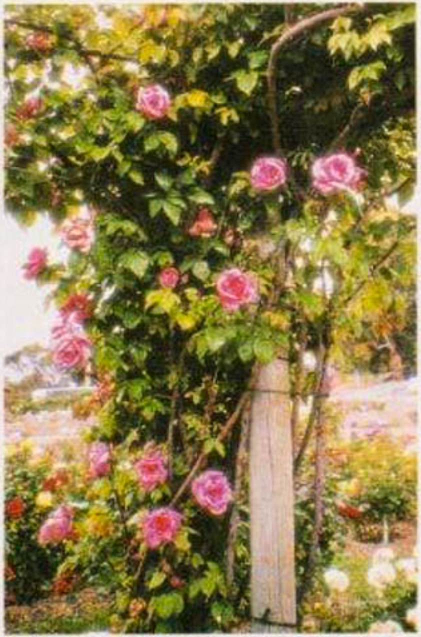


Clg. Helen Traubel with yellow Louisiana iris,
at David Ruston's Renmark Garden



Clg. Lorraine Lee (Alister Clark) at
Ross Roses Nursery, South Australia

Photos Courtesy : M.S. Viraraghavan

General view of rose beds in David Ruston's Renmark garden, South Australia.

Lilia Weatherly with her variety Pink Iceberg at Chateau Barrosa Garden, South Australia

Photos Courtesy : M.S. Viraraghavan

Our next port of call was the paradise created by David Ruston at Renmark. This is Australia's, and perhaps the world's, largest rose garden with more than 50,000 bushes of 4000 varieties. Every type of rose was to be seen - H.T's, floribundas, climbers, miniatures and an assortment of oldfashioneds - gallicas, damasks, centifolias, mosses, bourbons, teas, noisettes, hybrid perpetuals, musks and rugosas. This incredible collection was set off by the many ornamental trees - cottonwood, red oak, magnolia, redwood, willow, ash, elm, as also flowering peach, pear, apple, plum, apricot, cherry and hawthorn. Further enhancing the impact were the swathes of iris, daylilies, watsonias, crinums, agapanthus and clivias. A Viewing Tower in the center of all this glory gave one a panoramic view of the entire garden. But the most amazing feature of all was the great man himself who knew and loved every one of the 4000 roses. Charming, knowledgeable and willing to share this knowledge with anyone interested, he personally looks after the irrigation of his vast domain, and with the aid of just a few helpers, picks and packs the rose flowers everyday for his nursery business, and makes floral arrangements, big and small, for every variety of function, from weddings to funerals. More power to his elbow!

A very distinguished rose garden was that attached to Urrbrae House (in the foothills, south east of Adelaide) The garden has been planned to trace the history and development of roses from just before when the house was built - 1891. The present garden owes much to the efforts of the South Australia Chapter of the Heritage Roses of Australia. The Entrance Walk, a semi-circular path nearly 100 feet long is bordered with that lovely China, Cecile Brunner. Many old Teas - Betty Uprichard, Golden Dawn, Comtesse Vandal, Crimson Glory, Clg. Hadley and Talisman were grown well. An extensive pergola had, among others, Golden Showers and Bloomfield Courage. A bank of David Austin's Dapple Dawn with pink single flowers in profusion made a charming sight.

The closing function of the conference was held in the display garden attached to Ross Roses. A steep slope leading to a level area was landscaped with roses from the most modern to the oldies - a treat for the eyes - and every plant grown to perfection and in full bloom. A long pergola of climbing roses, including the shell pink Belle Portugaise and Alister Clark's Lorraine Lee made a gay picture (see phogotraph) as did the many beds of Tea roses.

In Adelaide itself we visited two public gardens - the North Bank Heritage Rose Garden and the Adelaide International Rose Garden. The North Bank garden is located on the banks of the River Torrens and is comparatively new - since 1996. It has a fine heritage rose collection grown under the aegis of the Heritage Rose Group. The Adelaide International Rose Garden, part of the Botanic Garden, is an exciting place with extensive displays of every kind of rose (see photograph) and charmingly framed by a curving hedge of the bright red climber, Dortmund. The scientific arrangement into various classes as also the excellent standard of cultivation was both an educative and aesthetic experience.

After the close of the Heritage Conference we were the guests of the South Australia Rose Society, staying with Wendy and Merv Trimper. Merv is currently President of the Society. Their garden was a blaze of colour with many modern roses grown to a peak of perfection - all cars driving down their road stopped to admire the unbelievable display. (see photograph).

The climber Gold Bunny was in stupendous form as also the McGredy raised red Dublin Bay covering the garage wall. The focal point in the front garden was (once again) Bloomfield Courage trained with the utmost skill as a weeping standard. We had caught the garden at its best - a few days hence was their Open Weekend when it would be opened to the public.

Another garden, lovingly tended in the cottage garden style was that of Pat and Roy Wilhelm. This garden overwhelmed you not with bright colour but with exquisite shadings of form and texture, of roses and companion plants, in pastel shades, ranging from short clumps to tall spired delphiniums. Pat informed us that the magnificent show was due to systematic mulching with manure without disturbing the soil.

From Adelaide our itinerary took us to Melbourne - the home of Alister Clark who, as we said earlier, hybridized with R. gigantea and therefore of special interest for us. We were keen to see as many of his roses as possible and in this endeavour we were ably helped by our hosts, Margaret and Tom Roberts and their son David. They cleverly devised a plan of action whereby we visited all Clark-related gardens in the space of a few days. Starting with the Royal Botanic Garden which has an interesting specie collection, including the 'gooseberry' rose - R. stellata mirifica, we next visited old rose enthusiast Diana Fickling's garden at

International Rose Garden, Adelaide, South Australia.

Garden of Wendy & Merv Trimper, Adelaide

Photos Courtesy : M.S. Viraraghavan

Diana Fickling's Garden at Waverley, near Melbourne, Victoria, Australia.

Alister Clark Memorial Rose Garden, Bulla, near Melbourne.

Photos Courtesy : M.S. Viraraghavan

Waverley. Her Francesca (Hybrid Musk) was covered with flowers, as were many David Austin roses and Alister Clarks. Again, the combinations of roses in pastel colours were particularly appealing (See photograph).

Victoria State Rose Garden at Werribee Park is beautifully landscaped. We visited it just after the Australian bred roses section had been opened and these made a glorious spectacle. A 400 metres long curving heritage rose border with 250 varieties encircled the Tudor rose design shaped beds of David Austin's English roses, modern H.T.'s, floribundas and climbers. The rows of standard and half standard roses were immaculate - the floribunda Brass Band (apricot yellow) being a prime example. This huge garden is exclusively managed by the Victoria State Rose Garden Supporters, Werribee Park, a keen volunteer group. (See Bengal Rose Society's book, "Beautiful Rose Gardens Around the World" for more details)

We asked the two volunteers, Len Broadstock and Wal Johnston who showed us around, their favourite roses. Len's were Freisia, Rebell (Kordes 1998), Elina (Dickson) and Bridal Pink. Wal's list had Red Cedar (H.T., Kordes 1981), known here as Burgund), Pakeha (cream H.T. of Australian breeder George Dawson), Rebell, Peacekeeper (Harkness) and Elina.

The search for more information on Clark roses led us to John Nieuwesteeg and his nursery, which was on the grand scale and being readied for Open Weekend. Despite being very busy, John took us around the display garden and especially his Alister Clark collection. When asked about his favourites, he enumerated Graham Thomas (David Austin), Mr. Lincoln, Apricot Nectar, Elina, Diamond Jubilee, Peter Frankenfeld, Blue Moon and Lady Huntingfield (Alister Clark yellow H.T.). Margaret and Tom took us next to Laurie Newman's 'Reliable Roses" nursery which is large and run almost single-handedly by him. He showed us a rose introduced by him and named "Alister Clark" - a sport of a Clark rose, Marjorie Palmer. Laurie liked the roses bréd by the English hybridiser, le Grice, who bred unusual coloured roses. We saw his Vesper (orange brown) and Jocelyn (dark reddish chocolate). Laurie's list of favourites included Pristine, My Choice, Tatiana, Honor and The Doctor. Laurie has India connections - his wife had emigrated from Kanpur/Lucknow.

We had to see the suburb of Bulla, where Clark's ancestral house Glenara is situated. The local municipal council and a band of enthusiastic volunteers led by Tid Alston, whose parents were close friends of the

Clark family, have created a charming little jewel of a garden - the Alister Clark Memorial Garden. Many of the 'lost' Clark roses were refound in Tid's garden and have been planted here. Golden Vision (R.gigantea x Marechal Neil), Nancy Hayward, Lady Huntingfield, Squatter's Dream (clear yellow single gigantea shurb) Milkmaid, and many others, all carefully tended, are beautifully set off by edgings of shorter Clark roses, (like Borderer, salmon pink) lavender and heuchara (a dwarf perennial with sprays of white, pink or red flowers.)

From Bulla we drove quite a distance through what was earlier 'gold country' - prosperious in the Gold Rush era, now abandoned and forlorn. But we saw a real rose gold mine in the nursery "Hilltop", run by Ian Huxley, which has a different sort of climate - very dry, frosts in winter, heat-waves in summer. This hillside garden was in fantastic bloom, the Tea/Noisettes being particularly profuse - Cloth of Gold (yellow) and William Allan Richardson (apricot). Sadly, this latter variety which at one time grew in India is no longer available. R. wilmotii and R. watsoniana, a variant of multiflora with very different foliage were also notable.

Looking back, we are repeatedly amazed - and inspired - by the many rose gardens we had the pleasure of seeing. What marvelous results have been achieved with little help, but much enthusiasm, even in climates with very low rainfall South Australia gets hardly 15 inches of rain in a year !!

The outstanding feature of all the gardens was the readiness to grow a wide range of roses as well as the aesthetic integration of roses into the general garden scene. There was hardly a garden where the roses were arranged in melancholy, stiff geometric formations as is the fashion in our country. Everywhere the use of roses as standards, as arches and climbers so that both horizontal and vertical aspects were taken into consideration, added greatly to the visual impact.

Helga Brichet and others in front of the giant bush of R. banksiae normalis in China. (Please see her article)

Photo Courtesy : Helga Brichet

Mike Lowe- America's Tallest rose grower (!) and the first international member of IRF, at his nursery in New Hampshire, USA

Photo Courtesy : M.S. Viraraghavan

ROSE BREEDING FOR WARM CLIMATES

M. S. Viraraghavan

(This is the text of the talk given at the WFRS Regional Rose Convention, Capetown, South Africa, 28th Oct – 2nd Nov 2002)

A few words on the case for a separate line of breeding for warm climates would be appropriate. In fact, the need for such a line was brought home to me in a somewhat painful manner during the recent severe drought in my farm where I test out my new roses. This farm has a warm dry climate. When the water supply failed and could not be restored for over a fortnight nearly 50% of the hybrid teas died, whereas all the Tea roses survived.

All of us are proud that the rose is considered the world's favourite flower. But unfortunately the world we have in mind does not include vast areas of the tropics as well as considerable parts of the warmer sub-tropics where modern roses can only be grown by enthusiasts. You go to a garden loving state like Singapore where there are hundreds of ornamental plants immaculately grown – there is not a single rose there.

Rose growing with modern roses, even in the warmer parts of the sub-tropics is full of problems. Very few, if any, H.T.'s will thrive in Bermuda. In India roses become very difficult to grow in the warm moist coastal areas and even in the more favourable conditions in North India and the central plateau, the European raised roses rarely do well. It is mostly the Americans, especially the older AARS winners, which have been evaluated over a range of climates which succeed. The position is much the same in the warmer parts of the U.S. and Australia and, I'm sure, Africa. For South Africa, a clear pointer is the fact that it is mainly roses raised for greenhouse cultivation in Europe by Kordes which are found suitable for outdoor growing by your own Ludwig Taschner.

Even commercial rose growing for the floriculture industry has similar problems. Standard cut-flower varieties raised in temperate climates have less than optimum yield and flower quality in the higher temperatures of our country. An interesting joint research venture between Indonesian horticulturists and Dutch experts (at Wagenigen) showed that standard cut-flower varieties had much shorter stems, but a greater number of thorns, when grown in Indonesia under subtropical conditions (at Cipanas, Indonesia, altitude 1100 m, latitude, 7 degrees S. of the Equator.

All this should not give the impression that warm climate rose breeding is an impossible task. All that has happened is that the big boys have not taken it up – maybe they are doing it in secret!!! It is up to people like us, amateur rose breeders, to show the way.

A separate line of breeding for warm climates is a must. And even though this carries with it the implication of a conscious reversal of western rose breeding , with its natural emphasis on cold hardiness.

The need for such a line was emphasized quite sometime back – in the 1930's – by B.S. Bhatcharji, India's premier rose breeder.

Another way of describing the task is to say that the warm climate rose breeder should attempt to do what David Austin, and now a host of others, have done for the heritage roses of the Western world. New forms of the roses of Asia – the Teas, the Chinas – as well as different Hybrid Teas and shrubs, are the objective.

What are the methods available to evolve better roses for warm climates? Possible strategies for tropical rose breeding include the use of

a. Heritage roses like 'Archduke Charles', 'Perle d'Or', 'Cécile Brunner', 'Mme Falcot', etc. which do well in warmth.
b. Selected garden roses like 'Montezuma', 'Maria Callas', 'Peter Frankenfeld' etc., which do well in the warmer parts of the world.
c. Work with new, unused species with heat resistance. That is, bringing in new genetic input.

Strategies (a) and (b) suffer from the disadvantage that fundamentally no fresh genetic input is involved. As the great Wilhelm Kordes said, 'the soup ladle will bring out only what is in the tureen'.

In addition to bringing in fresh blood it is also essential to remember the importance of the chromosome number and its relation to heat resistance . If we examine the popular warm climate roses from this angle you'll notice that the diploid ones such as the Teas and Chinas do best in the really warm climates. A typical example is the China, 'Archduke Charles', which does well even under the trying warm, humid conditions of Madras city, just 13 degrees North of the Equator. Where the weather becomes sub-tropical, tetraploid roses with the right combination of genes will also do well.

The distribution of rose species also corroborates this, as we find that the diploid species – *bracteata, clinophylla* and *gigantea*, with which I am working, *Rosa sempervirens* etc. are endemic to the warmer parts of the world. In the Northern Hemisphere as we proceed north away from the Equator, tetraploid species appear, and the circumpolar *R. asicularis* is octoploid. The pattern is evident.

In the search for better roses I've been working with a very interesting species – *Rosa clinophylla*, probably the only tropical rose species in the world. This species exists in 3 forms, one of which has an astonishing habitat – the islands in the River Ganges, just north of Calcutta. Apart from moist heat this species survives periodic flooding, in fact, the rose spends nearly 6 months of the year under water, with just the tops of the stems showing. The other forms of this species include kinds adapted to hot dry climates as well as to cool desert conditions.

Another species with which I am working is *Rosa gigantea* – the world's largest rose species, which is capable of reaching 50 feet while climbing through forest trees in India's north east. It is also found in Myanmar (Burma) and southern China - the latter variant is the one in the background of the Tea roses.

I will show you some slides which show the various stages of work done with these 2 rose species. Repeat flowering hybrids in modern colours have appeared in both lines. But what is now needed is the testing of these hybrids and their future progeny for adaptation to warmer climates.
(Show slides and describe each one)

(Mention features of *R. gigantea*, especially its habit of flowering in winter, and its ability to produce better cut-flower roses – a feature of great importance for the commercial rose grower.)

We now come to the final part of this talk –- What should we look for in the future. The possible areas of improvement include

a. Rose plants of various sizes from miniatures to shrubs.
b. More acceptable plant habit
c. Disease resistance
d. Evergreen foliage – thornlessness
e. Fragrance

And, as far as commercial roses are concerned

f. Capacity to flower in winter.

In conclusion it should be stressed that it is crucial to improve rose foliage quality and petal texture, which are vital in a warm climate. In the tropical situation, roses have to compete with a host of other ornamentals with lovely foliage, and the rose, when not in flower, comes out distinctly second-best.

Our objective should be to produce roses which look attractive even when not in bloom, as emphasized by authorities like Thomas Rivers (19th century) and Sam McGredy. In other words, roses with shining evergreen foliage.

Here, work with evergreen species is a must. What is encouraging is that almost all evergreen rose species, like *clinophylla, gigantea, laevigata, bracteata,* and *sempervirens,* are natives of the warmer parts of the world and it should be perfectly possible to have rose plants with flowers of the perfect form of the modern hybrid Tea combined with foliage as beautiful as that of *gigantea* and *laevigata*.

I leave you dreaming of this prospect.

Slides for the Talk “Rose Breeding For Warm Climates”

1. R. clinophylla, Ranchi form
2. R. clinophylla x R. bracteata
3. Pink-Pink – (Mrs. B.R.Cant x (Mrs. B.R.Cant x R.clinophylla))
4. Bonica x R. clinophylla
5. Virmont
6. Landmont
7. (Bonica x R.clinophylla) x Silver Moon
8. Charlmont (Mme. Charles Sauvage x Virmont)
9. Landmont x Carmousine
10. Bold 7 x New Zealand
11. Bold Showers x Brandy
12. Mme. Charles Sauvage x Arthur Bell x R. clinophylla
13. Arjun x Landmont
14. Landora x Charlmont
15. Bonbright x Ingrid Bergman
16. Delicate Beauty x Virmont
17. R. gigantea, fully open
18. R. gigantea, fully open
19. R.gigantea foliage
20. R. gigantea seed pods
21. Rev d’Or x R. gigantean
22. Pink Tea x Pink china x R. gigantean
23. Marie van Houtte x Echo x R. gigantea
24. (Carmousine x R. gigantea)II – Cargiant II
25. Cargiant III
26. Athena x R. gigantea
27. Chrysler Imperial x R. gigantea
28. Carefree Beauty x Cargiant I
29. Brown Velvet x Cargiant I – ‘Brown Giant’
30. Eterna x Brown Giant.
31. Eterna x Brown Giant, bush
32. Red Velvet x Brown Velvet x Cargiant I

33. R. clinophylla x R. gigantea
34. R. clinophylla x R. gigantea, bush
35. R. clinophylla x R. gigantea

Copies of the original

Indian Rose Annual 2003

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M.S. Viraraghavan

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A few words on the case for a separate line of breeding for warm climates would be appropriate. In fact, the need for such a line was brought home to me in a somewhat painful manner during the recent severe drought in my farm where I test out my new roses. This farm has a warm dry climate. When the water supply failed and could not be restored for over a fortnight nearly 50% of the Hybrid Teas died, whereas all the Tea roses survived.

All of us are proud that the rose is considered the world's favourite flower. But unfortunately the world we have in mind does not include vast areas of the tropics as well as considerable parts of the warmer sub-tropics where modern roses can only be grown by enthusiasts. You go to a garden loving state like Singapore where there are hundreds of ornamental plants immaculately grown - there is not a single rose there. No wonder "there is scope for breeding new varieties better suited to lowland conditions in Malaysia" (say R.E. Holttum and Ivan Enoch in "Gardening in the Tropics" pg. 83, published by Times Edition, Singapore).

Rose growing with modern roses, even in the warmer parts of the sub-tropics is full of problems. Very few, if any, H.T.'s will thrive in Bermuda. In India, roses become very difficult to grow in the warm moist coastal areas and even in the more favourable conditions in North India and the central plateau, the European raised roses rarely do well. It is mostly the Americans, especially the older AARS winners, which have been evaluated over a range of climates which succeed. The position is much the same in the warmer parts of the U.S. and Australia and, I'm sure, Africa. For South Africa, a clear pointer is the fact that

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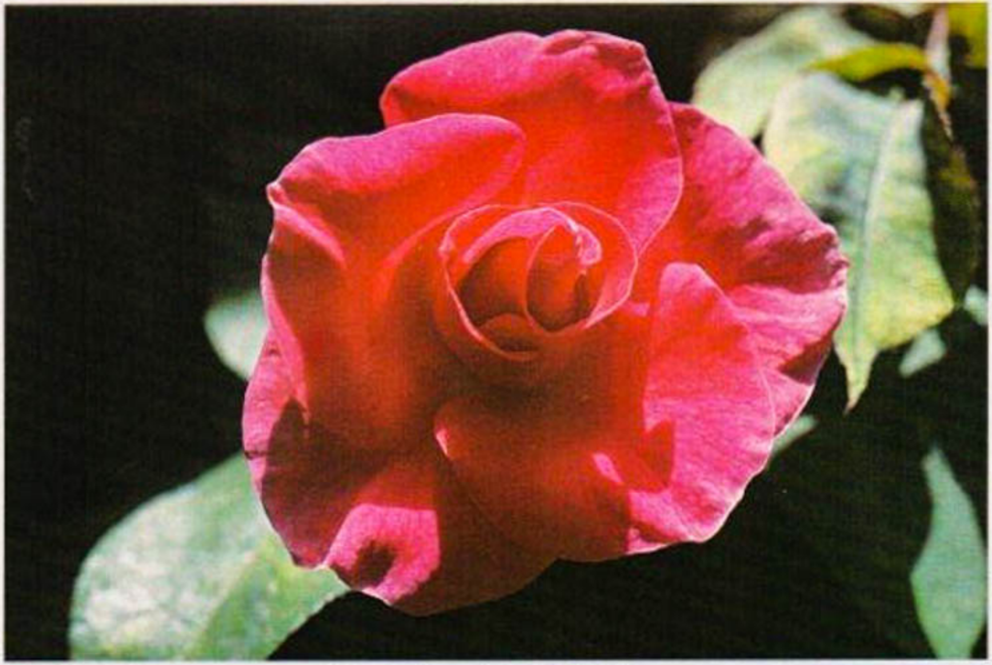
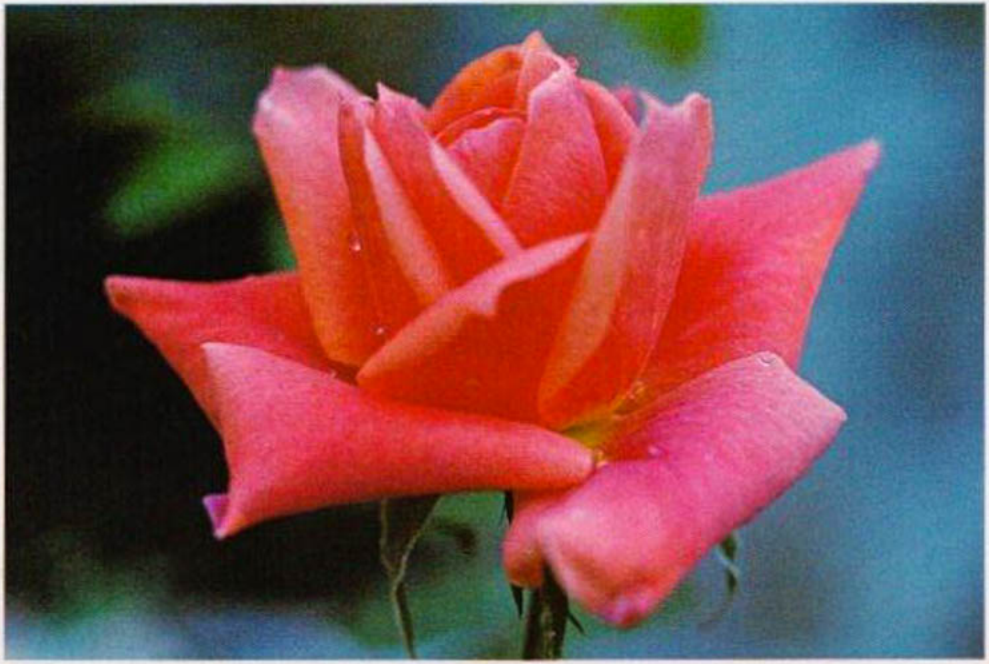


Chryser Imperial x R. Gigantea

Photo Courtesy :- M.S. Viraraghavan



Arjun x R. Clinophylla Seedling

Photo Courtesy : M.S. Viraraghavan

Strategies (a) and (b) suffer from the disadvantage that fundamentally no fresh genetic input is invovled. As the great Wilhelm Kordes said, 'the soup ladle will bring out only what is in the tureen'. Expanding on the theme the wellkown authors Roger Phillips and Martyn Rix observe "It is sad that nearly all modern rose breeders concentrate on roses that are hardy; few bother to breed any for substropical climates and thereby fail to make use of some of the exciting tender species" (Pg. 261, Vol I, Conservatory and Indoor Plants, Macmillan 1997.)

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ROSE WANDERINGS IN EUROPE

M.S.Viraraghavan and Girija Viraraghavan

We had been planning to visit the famous rose gardens of Europe for quite some time. When we learnt that the well known Rosarium at Sangerhausen, near Leipzig, in Germany was celebrating its 100th anniversary with an international conference, we felt that attending the event could be the focus of such a tour.

So we set off, and, having landed in London, proceeded first to see the roses at the Royal Horticultural Society's Garden at Wisley. Wisley is a garden with every kind of ornamental plant you could imagine – literally, a garden for all seasons. But we were specially interested in seeing the newly laid out Golden Jubilee Rose Garden, planted with a selection of rose introductions of the past 20 years, with all types being represented, from patios (miniatures) to climbers and shrubs. It was a trifle too early for roses (19th June) but the climbers were already in good bloom. One of the different multiflora ramblers, 'Grevillei' (also known as multiflora platyphylla or the 'Seven Sisters Rose') was in glorious bloom, with flowers of deep to soft pink, with sometimes a hint of red. Somewhat fancifully we could imagine the seven different colours in each truss of flowers – hence the name. 'Kathleen Harrop', the shell pink and fragrant sport of the well-known Bourbon, 'Zéphirine Drouhin', was equally spectacular, as were the standards of the blazing red, 'Dortmund' (which does very well in the warm climate of Texas and should be introduced in our country) and 'Ingrid Bergman' (bright red). An entire bed planted with the new colour break, 'Rhapsody in Blue' was starting to bloom – more on this rose later.

The next day we went to Kew, where again the roses were just starting. But in the Temperate House, we were delighted to see the delicate white trails of *R. moschata abyssinica* – from the highlands of Ethiopia.

A few days later we arrived at Sangerhausen, proudly called 'Europa Rosarium' – the Rose Garden of Europe. This unbelievable collection of nearly 7000 different kinds of roses – many of the older ones are found only here – has been maintained by the ardent rose lovers of Germany through the travails of two world wars, years of Soviet rule and the problems of a reunited Germany. A full write-up on this garden appears in this annual. But we were particularly struck by the way in which extra plants of each of the varieties are maintained as replacements – a tremendous task, especially with the older and more delicate varieties – as well as the unique method of training climbers. The climbers are trained up 15-20 foot high larch poles. This way they can be planted quite close – the effect is stunning. But every winter every climbing rose has to be taken down, laid flat on the ground and protected with a covering of straw. Come spring they have to be retied up the poles. That's dedication for you, especially as there are only 16 staff to look after the 40+ acres of garden.

Many of the historic roses were to be seen - 'Margaret McGredy' (the parent of 'Peace'), 'Madame Caroline Testout', 'Crimson Rambler', the black rose, 'Nigrette', 'Crimson Glory'…….the list is endless. One example – there are over 500 Hybrid Perpetuals alone!! The premier roses of the 20th century which had received the accolade of the "ADR Award" of Germany, were arranged in square beds, each bed planted with roses of a period of 25 years, starting from 1900 onwards.

The venue of the International Conference was the old church called Jacobikirche, in the historic copper mining town of Sangerhausen. The speakers included Peter Harkness, well known to Indian rosarians, Charles Quest- Ritson whose new book 'Climbing Roses' is a 'must read', Wilhelm Kordes, Alain Meilland, a Tantau representative and many other German rosarians - unfortunately we do not know the German language.

The dynamic past President of WFRS, Helga Brichet, spoke about a lovely rose garden to the north of Rome, Italy, belonging to the Ducrots — an explorer's garden, full of fascinating roses collected from romantic corners of the world, such as the Silk Route from India to China. The collection boasts of no less than 8 traditional roses from the Indian sub-continent, collected from places like Fort Chanwa, near Luni, Rajasthan, and the garden of the Maharaja of Karauli.

Ms. Brichet had, very appropriately (considering the venue of Sangerhausen) convened a meeting of the Conservation Rose Committee (see last year's annual, where Helga has written about the work of this committee). We mentioned the work in India, especially the rose species maintained by the National Bureau of Plant Genetic Resources near Shimla, which has 40+ species.

Sangerhausen town itself has been beautifully renovated and restored, carefully retaining its old world charm of cobbled streets, little cafes and town squares. One pleasing feature was the way climbing roses were trained up the stone walls of many of the houses and shops. A picturesque red train carries visitors from the heart of town to the Rosarium, a few kilometers away.

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We also went to the National Botanic Garden, Glasnevin, in Dublin, which has a large collection of Chinese plants - bounty from the many plant collecting expeditions to that country. The rose garden was past its best, but the red floribunda, 'Eye Paint', trained as a climber was in exceedingly good bloom.

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Roses apart, Hampton Court had wonderful displays of many other flowers, all grown to perfection, as also exhibits from South Africa, West Indies and other countries. Hampton Court represents British horticulture at its best, and our day there was a fitting climax to a month of rose wanderings in Europe.

Copies of the original

Indian Rose Annual 2004

Rose Wanderings In Europe

M.S. Viraraghavan and Girija Viraraghavan

We had been planning to visit the famous rose gardens of Europe for quite some time. When we learnt that the well known Rosarium at Sangerhausen , near Leipzig, in Germany was celebrating its 100th anniversary with an international conference, we felt that attending the event could be the focus of such a tour.

So we set off, and, having landed in London, proceeded first to see the roses at the Royal Horticultural Society's Garden at Wisley. Wisley is a garden with every kind of ornamental plant you could imagine – literally, a garden for all seasons. But we were specially interested in seeing the newly laid out Golden Jubilee Rose Garden, planted with a selection of rose introductions of the past 20 years, with all types being represented, from patios (miniatures) to climbers and shrubs. It was a trifle too early for roses (19th June) but the climbers were already in good bloom. One of the different multiflora ramblers, 'Grevillei' (also known as multiflora platyphylla or the 'Seven Sisters Rose') was in glorious bloom , with flowers of deep to soft pink, with sometimes a hint of red. Somewhat fancifully we could imagine the seven different colours in each truss of flowers – hence the name. Kathleen Harrop, the shell pink and fragrant sport of the well-known Bourbon, Zephirine Drouhin, was equally spectacular, as were the standards of the blazing red, Dortmund (which does very well in the warm climate of Texas and should be introduced in our country) and Ingrid Bergman (bright red). An entire bed planted with the new colour break, Rhapsody in Blue was starting to bloom – more on this rose later.

The next day we went to Kew, where again the roses were just starting. But in the Temperate House, we were delighted to see the delicate white trails of R. moschata abyssinica – from the highlands of Ethiopia.

A few days later we arrived at Sangerhausen, proudly called 'Europa's Rosarium' – the Rose Garden of Europe. This unbelievable

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'Hill View', Fern Hill Road, Kodaikanal - 624 101, Tamilnadu

collection of nearly 7000 different kinds of roses – many of the older ones are found only here – has been maintained by the ardent rose lovers of Germany through the travails of two world wars, years of Soviet rule and the problems of a reunited Germany. A full write-up on this garden appears in this annual. But we were particularly struck by the way in which extra plants of each of the varieties are maintained as replacements – a tremendous task, especially with the older and more delicate varieties – as well as the unique method of training climbers.

The climbers are trained up 15-20 foot high larch poles. This way they can be planted quite close – the effect is stunning. But every winter every climbing rose has to be taken down, laid flat on the ground and protected with a covering of straw. Come spring they have to be retied up the poles. That's dedication for you, especially as there are only 16 staff to look after the 40+ acres of garden. Many of the historic roses were to be seen- Margaret McGredy (the parent of Peace), Madame Caroline Testout, Crimson Rambler, the black rose, Nigrette, Crimson Glory.......the list is endless. One example – there are over 500 Hybrid Perpetuals alone!! The premier roses of the 20th century which had received the accolade of the "ADR Award" of Germany, were arranged in square beds, each bed planted with roses of a period of 25 years, starting from 1900 onwards.

The venue of the International Conference was the old church called Jacobikirche, in the historic copper mining town of Sangerhausen. The speakers included Peter Harkness, well known to Indian rosarians, Charles Quest- Ritson whose new book 'Climbing Roses' is a 'must read', Wilhelm Kordes, Alain Meilland, a Tantau representative and many other German rosarians- unfortunately we do not know the German language.

The dynamic past President of WFRS, Helga Brichet , spoke about a lovely rose garden to the north of Rome, Italy, belonging to the Ducrots—an explorer's garden, full of fascinating roses collected from romantic corners of the world, such as the Silk Route from India to China. The collection boasts of no less than 8 traditional roses from the Indian sub-continent, collected from places like Fort Chanwa, near Luni, Rajasthan, and the garden of the Maharaja of Karauli.

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Fryers Rose Nursery Exhibit at
Hampton Court Flower Festival

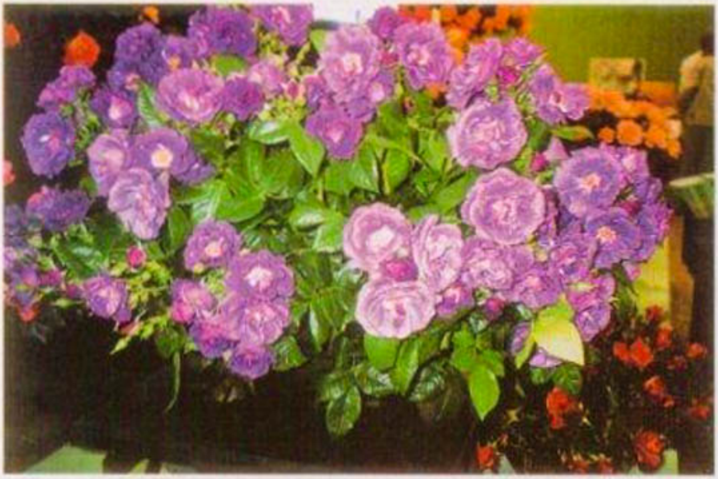
RNRS garden, general view

'Dentelle de Malines' at Wilhelmshoehe, Kassel, Germany

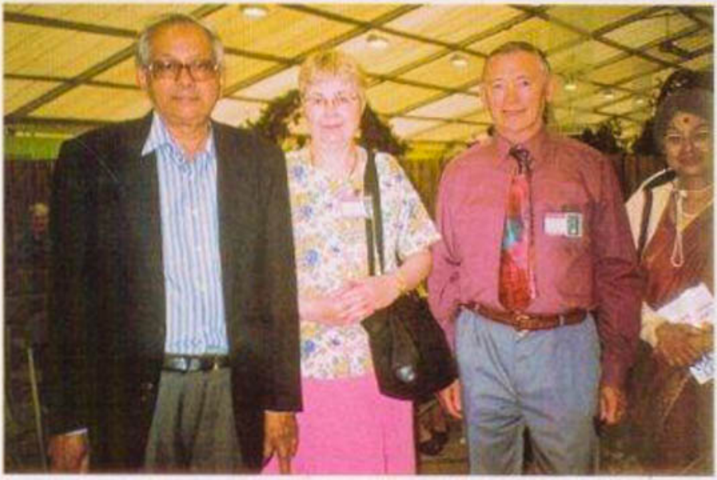
'Dortmund' at Royal Horticultural Society Garden at Wisley, England

'Eye Paint' at National Botanic Garden,
Glasnevin, Dublin, Ireland

The red and blue borders, Lady Helen
Dillon's Garden, Dublin, Ireland



'Rhapsody in Blue' at Hampton Court
Flower Festival



The Editors with Mrs. and Mr. Frank Cowlishaw.
Mr. Cowlishaw is the breeder of 'Rhapsody in Blue'

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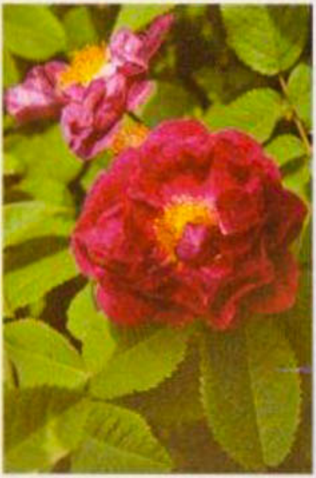


'Souvenir du Docteur Jamain' (Hybrid Perpetual)
at Mottisfont, England

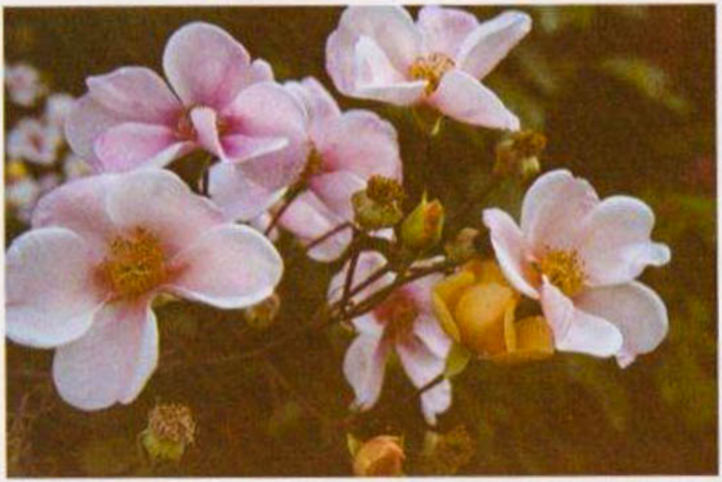
'White Flight' at Mottisfont Abbey Garden,
"The Graham Stuart Thomas Rose Garden"

Rambler roses trained on larch poles,
Sangerhausen, Germany

In full bloom, Sangerhausen

Roses and other climbers on a free form trellis
at Bruges, Belgium

Unnamed seedling by Ann Velles at the
Louis Lens Nursery near Ostend, Belgium



(Trier x Mutabilis) in Ivan Louette's Roserie Communale Garden, Gistoux -Chaumont, Belgium

'Royal William' rose (red) and the lake beyond at Queen Mary's Rose Garden, Regents Park, London. Editor Girija Viraraghavan in picture display of Rhapsody in Blue, the first rose which shows shades of blue purple rather than the red purple of other purple roses. This had rightly been selected as The Rose Of The Year. We were excited to meet our friend, the proud hybridiser, Frank Cowlishaw. We had known him by correspondence for many years and so were delighted to meet him in person. Apart from its most unusual colour, Rhapsody in Blue has a lovely fragrance and there was a short presentation by the perfume company which was introducing a rose fragrance derived from it. Samples of this were passed on to the audience.

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François Crépin and the Discovery of R*osa gigantea*

M.S.Viraraghavan

It was the 2nd of June 1888 when M. François Crépin received the first specimen of *R. gigantea* collected by General Sir Henry Coilett in Burma (now called Myanmar). Crépin's observations are best detailed in his own words:

E*xtract of the Report of the July 2, 1888 Session of the Belgian Royal Society of Botany Bulletin, Volume XXVII, 2nd part....*

“DESCRIPTION OF NEW ASIATIC ROSE, By François Crépin, Director of the National Botanical Garden, Brussels

Last June 2nd, Mr David Prain, Conservator of the Seebpore Botan*ical Garden, near Calcutta, sent me four beautiful flowering branchlets of a rose collected by General Collett in the Shan Hills between the Kingdom of Burma and the Kingdom of Siam. Mr Prain, in a letter accompanying the specimens, said that Mr. Collett himself described this rose as a magnificent species, sprawling over rocks and climbing into trees, having a pure white flower 5 inches in diameter.*

If the species is new, Mr Collett himself wishes to give it the name: Rosa gigantea. To judge by the specimens I received, this rose is truly magnificent and it appears to be very vigorous; its corolla is certainly the largest one to be found among single rose flowers.

It is known that, in R. indica Auct., the infloresecence is nearly always multi-flowered and provided with bracts. So if one assumes that R. gigantea ordinarily has a multi-flowered inflorescence and that the single is the exception, one would probably be right to classify' it in the Indicae section.

It remains to be seen if the species is remontant as is R. indica.

While awaiting additional information, I will give a description of this rose, that admits it provisionally as a species.

Rosa gigantea Collett Mss. (Sect. Indicae?).

Unifloral inflorescence, usually without bracts, trifoliate leaves thick *smooth pedicel; ovary large, ovoid, attenuated towards the two extremitites, glaucescent, smooth; flower bud large, ovoid el'ongate (4 cms to sepals' end); sepals very long and entire, tapering from the base to the summit, slightly dilated at the tip, whitish pubescent on the internal face and along the sides, which have fine glands reflexing at antithesis. One completely spread out corolla measured 12 centimetres in diameter!*

This rose is unpublished and appears to constitute a distinct species. In my opinion it should be classified as being closely relate00d to R. indica Auct. non L. (1). Does it belong in the section that I named Indicae? This is quite possible but I would need supplemental information to be able to decide this question.

Whatever the case, General Collett's discovery is worth bringing to the attention of scientists and rose fanciers (amateurs). If any one succeeds in introducing R. gigantea into Europe, and in growing it will enrich choice collections by its enormous corolla and beautiful foliage; moreover it will be, by crossing it with other species, the source, of hybrid products probably superior to those of R. indica. "

It is evident from the above that M. François Crépin was no mere taxonomist. He was obviously a lover of roses, which is far more important from the rose fancier's point of view. Subsequently, the question whether R. gigantea was indeed a new species and the fact that it was also to be found in India (Manipur) was confirmed.

Let us again reproduce Crépin's own words from the Extract ol the Report of the January 12, 1889 Session of the Belgian Royal Society of Botany Bulletin, Volume XXVIII, 2nd part, para 14.

"NEW OBSERVATIONS ON ROSA GIGANTEA COLLETT"

by François Crépin

Since I first described Rosa gigantea Collett (1), I have been able to examine some new materials that allow me to complete the earlier description. Besides what I received from General Collett, I also obtained some pieces of information it would be useful to know.

(I) See Extract of the Report of the July 2nd 1888 Session of the Belgian Royal Society of Botany Bulletin, Vol. XXVII, 2nd para, Pgs 146-150.

In a letter to me which he wrote at Meikrites (High Burma) dated July 29th the botanist informed me that he found R. gigantea in villages of *Myromati, Pwehta, Kalow, Koni, etc., that are located in Myelat district (High Burma)* *latitude: N 20°40' Longitude E 96°30', at an altitude between 4000 and 5000 feet. The species even if uncommon, is not* rare as *is it was observed by my correspondent in 14 or 15 different places in Myelat district. Its canes that may reach 30 and even 40 feet long, climb on rocks, trees and shrubs.*

In the Shan Hills district where R. gigantea grows, frosts are almost unknown, suggesting that this rose should be at least in central Europe some what protected against our winter's frost, or grown in well sheltered places.

With Mr Collett's letter was a deflorate specimen crowned by a much swollen receptacle (diam: 12mm). This thick walled receptacle was extremely hard although gathered in April (1888) and still contained very young ovaries.

The sample, composed only of a secondary branch is totally unarmed, as were the previously described ones.

Earlier, I had asked the General whether the R. gigantea inflorescence was uniflorous, and whether its stems are armed with prickles. He answered that indeed there are prickles, and that the inflorescences are uniflorous, but was unable to affirm that it was always so.

Last November, I had the unexpected opportunity to learn more about the new species from Burma. In a parcel of roses sent to me for identification by the Berlin Botanical Museum, there, were six specimens of a species collected by Mr. G Watt, with the following label: " 6320. Rosa... Khongui. 6000 ft. April 1882'. Attached to one sample is a small label reading: 'Field no '6404. Herb. G Watt'. These six samples are none other than R. gigantea!!-of which the nine inflorescences are all uniflorous, each one accompamied by a basal 1-3-5 foliate leaf. Floriferous branches are usually unarmed, or, rarely, bear 1 to 3 small hooked prickles. On a robust length of stem will sometimes be found strongly hooked, thick, short, dispersed and rather numerous prickles more or less reminiscent of those of those R. arvensis Huds.

Suspecting that the Kew Herbarium might contain other samples from the same collector, I hastened writing to Mr Nicholson, asking him to undertake some searches. Obliging as usual, he responded immediately that in Kew's collections were two herbarium sheets of this kind: one labelled 'April17th 1882 at Kongui', the other labelled 'At Sirohfurar on April 11th 1882, 6000ft'. In a handwritten note, this Rose is referred to as Rosa macrocarpa Watt. On the first sheet, one inflorescence is triflorous the others are uniflorous; on the second sheet all the inflorescenes are uniflorous.

The name macrocarpa is probably justified by this species' fruit size. In the Berlin Museum Herbarium, there are two fruits the look nf\ which makes *one think that they were one year old when the blooming samples were gathered. Broadly ovoid, their diameter measures from 15 to 18 mm. The sepals which were absent (in these materials) appear very reflexed post anthesis and during maturation. (1).*

Mr G Watt's discovery considerably widens R. gigantean's dispersion, area since Munipur of Manipur province, where this collector observed it, is more than 5$^{0'}$ N from Burma's Shan Hills. Perhaps this remarkable species spreads east to south western Chinese provinces"

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(1) While printing this notice, I received from the Calcutta Botanical Garden Director, M.G. King, two mature R. gigantea fruits with 30 achenes that were sown. These fruits are big, pyriform, about as wide as long (23 to 24mm), walls very thick, the flesh of which when dessicated becomes very hard and horny, with the cavity of the ovary very small, relatively. Sepals reflexing and apparently persistent. Achenes very big: 6.6 mm long by 5.7 mm wide.

(Note added while in the press).

The next stage was the flowering of this great rose in Europe which is described in vivid detail in the English gardening journal “The Gardener's Chronicle" issues of March 4th 1905 and May 11th 1912 which are reproduced below.

The Gardeners' Chronicle, March 4th 1905

Rosa gigantea (see supplementaiy illustration)

"In 1889 we received from Sir George King then the Director of the Calcutta Botanic Garden, some seeds of this noble Rose, which were distributed among those likely to succeed in its culture. Probable seeds were distributed from other sources also. Mr. GEORG PAUL informs us that he raised seedlings from'this Rose, but that they damped off; and the same fate befell others raised by Mr. LEACH. Some disappointment has been felt, at the circumstance that while the Rose grows with the greatest freedom, as at Kew and elsewhere, flowers have only very rarely been produced. Eventually in 1898 Lord BROUGHAM had the *satisfaction of flowering the plants in his garden at Cannes. In his “List of Roses now in cultivation at the Chateau Eleonore at Cannes” published in 1898, his lordship mentions the plant as having flowered in his garden for the first time in Europe last month (April*

1898 presumbly). He gives a photographic representation of it and describes it as -

"A splendid plant, making growths of 40 feet or more, with rambling branches armed with irregular prickles of moderate size, often in pairs at base of leaves, which are about 3 inches long and glabrous. The flowers are solitary, about 6 inches in diameter. Which size will not unlikely be increased when the plant is older and stonger, of a golden with yellow centre containing an unusual quantity of pollen. Petals large, broad, imbricated; disc large, styles much exserted, free, villous; stamens long. The most desirable and by far the finest single Rose I have ever seen. It does not seem to be very hardy and is subject to mildew *(as it is also here). The bud is long, larger, but very closely resembles that of Madame Marie Lavalée, and of a pure gold colour. This Rose when in flower should obviously be shaded, as the sun soon extracts the gold from the blooms, leaving behind a substitute of dirty white. At a short distance the flowers bear a close resemblance to a Clematis."*

Mr. F. CANT of Colchester, also succeeded in flowering it, but with such indifferent results that he discarded the Rose as useless for his purposes.

*Then came Mr. LEACH, the gardener to the DUKE OF NORTH-*UMBERLAND *at Albury, Surrey, who succeeded in 1903 in including the plant to produce two flowers, the first of which was just on 6 inches across. In February 1904, the same specimen produced about a dozen flowers and this year Mr. LEACH had the satisfaction of seeing 28 blooms on his plant, some of which were exhibited at the Royal Horticultural Society on Tuesday last, and secured for the exhibitor the award of a Cultural Commendation and a Botanical Certificate. Mr. LEACH cultivates the plant in a Peach-house, and the shoots are trained down on the wires.*

The colour of the flowers exhibited was ivory-white, and the foliage showed more pair of leaflets to each leaf than is represented in our illustration. A good figure is given in the Botanical Magazine, t. 7972 (September 1904), where the flowers are shown of a pale-prim rose-yellow colour, whilst the bud has the golden colour mentioned in LORD BROUGHAM's description. There is no doubt whatever from the glowing descriptions given by travellers, and such evidence as we now have, that this is indeed a grand Rose, and amply deserved the award made to it. In due time we doubt not we shall discover some means of inducing the plant to flower more freely. Up to the present, as Mr. HEMSLEY says, "every possible method of propagation has been tried ineffectually in order to obtain flowers more freely in this country, yet it flowers *profusely on the Rivera.”*

Sir GEORGE WATT was the first to discover this Rose (m Manipur), but the name R. gigantea was first published by the late Sir HENRY COLLETT, who found the plant in the Shan Hills, Upper Burmah. More recently it has been found in South-Western China by Dr. HENRY and others. We may therefore expect considerable variation, whilst the colour of the flowers, about which there has been d *diversity of statement, would naturally differ according to varying conditions and diverse stages of growth. Sir GEORGE WATT mentions, that the fruit is edible, as large as a small Apple, and that it is sold in the bazaars of Manipur State.*

Mr. FITZHERBERT, in our columns, May 2, 1903, p. 278. mentions the species as hardy in South Devon; and we have heard of it as grown on an outside wall at Reigate, Surrey".

THE GARDENERS' CHONICLE, May 11, 1912

ROSA GIGANTEA

"The flowering of this remarkable Rose at Kew in the spring 1910 (see Gardeners' Chronicle June 4, 1910, p. 370) was an event which had been looked forward to ever since its introduction into cultivation by General Sir Henry Collett, in 1889. At the present time it is again in flower in the Himalayan wing of the Temperate House, where it is planted out in a border amongst Himalayan and other tender Rhododendrons, and has climbed high up amongst the rafters and iron girders of the roof to a height of about 40 feet. At such a distance from the ground the beauty of its flowers cannot be perceived, but a spray is reproduced in fig.156 showing the flowers, which are from 4 to 5 inches in diameter, smaller than natural size. In the bud stage the colour is a rich copper, similar to W. Allen Richardson; this shade, however, fades rapidly as the bloom expands until, when it has been open a day or two, the colour becomes ivory white. The stamens are a bright yellow. The calyx lobes measure an inch in length, but there are specimens in the Kew Herbarium in which the lobes are even longer than this. A remarkable feature of the plant is its extraordinary vigour and the enormous amount of growth which it has made in former years. Some of the original seedlings raised from seed collected by General Collett in the Shan States were planted in several of the large houses at Kew in borders of prepared soil, and quickly made large specimens. Some of the shoots grew as much as 30 feet long. A large specimen was grown for 10 years or so in the Succulent House, where it grew rampantly. During the summer and autumn the lights on the roof were let down and the plant

exposed to all the sun and light possible, being afterwards tied down close to the glass and subjected to the dry conditions of the other inmates of this house during the winter. Other specimens were grown in the main building of the Temperate House, as well as in the Mexican and Himalayan wings. The temperature in each of the houses except that of the Himalayan wing, was sufficiently high to cause the plants to continue in growth all the year round, but in the Himalayan wing the plant obtained a rest of a few months during winter. The temperature of this house is never allowed to fall more than a few degrees below freezing point. When originally planted in this house in 1899 the plant grew rapidly in the rather stiff loamy soil of the border. The soil, however, did not suit many of the other occupants of the house, and in 1906 it was replaced with a sandy peat. This has had a marked effect upon the rate of growth of the Rose, the stems being much more slender and the growth more twiggy generally. It is to the change of soil that I attribute the flowering of the Rose, and not the hot summer of last year, for it produced flowers last year after the wet and cold summer of 1910. Cultivators would do well to try the effect of planting this Rose in a poor soil or where the roots may be restricted. They should also try the effect of a low temperature during the winter.

A full account of the discovery and histoiy of Rosa gigantea is given in the Gardeners' Chronicle, March 4,1905 p.136. The figure in the Botanical Magazine, tab. 7972, does not convey any adequate idea of the beauty of the flowers, which are depicted as being of a dirty, greenish white.

The plant was originally discovered by Dr. Watt in 1882 during the Government demarcation survey in Manipur at altitudes of 5-6,000 feet. It was later discovered by General Sir Henry Collett in the Shan Hills, Upper Burmah. It has since been collected by Dr. Henry. Mr W. Hancock, and recently by Mr. George Forrest in North-West Yunnan, China. Mr. Forrest has discovered specimens with rose-coloured flowers, which have been described as variety erubescens by Focke in Notes of the Royal Botanic Gardens, Edinburgh, v., p. 68. The variety was found in shady situations in the Lang-kong, Hocking, and Lichiang valleys, and is described by Mr. Forrest as “a semi-scandent shrub of 10-20 feet, with rose-pink, fragrant flowers.” Whilst this plant closely resembles Rosa gigantea in many respects, notably in its calyx lobes and in several minor details, I am of the opinion that it is distinct. The fruit and seed, which are important characters in determining Roses, are wanting in the herbarium material of Focke's plant, and I have little doubt but that, when these are obtained, the plant will prove to be distinct.

An interesting account is given in the Journal of the Linnean Society, xxviii., p. 6, by General Collett, of the conditions under which he found R. gigantea. Dealing with the flora of the district where it *grows, he says that it “was found on a plateau, at altitudes of 4-5,000 feet, where the traveller was at once struck with the temperate character of the flora. The trees were mostly Oaks and Pines, whilst the herbaceous plants were represented by species of Ranunculus, Viola, Hypericum, Clematis, &c.” Dealing with the giant Rose, he says:--"Only two species of Rosa were seen, and both were new. The beautiful R. gigantea is particularly conspicuous, climbing over the tall forest trees, from the tops of which the long pendulous branches, covered with very large, white flowers, hang down in rich profusion. This Rose, which has larger flowers probably than any other wild species, is seen from* a *considerable distance in the jungle, reminding one more of a huge Clematis than of a rose... It is only locally abundant, chiefly in dark shady valleys. The other rose referred to was R. collettiana, which, I believe, is not yet in cultivation.*

C.P. Raffill. "

This completes the story of the discovery and flowering of *R. gigantea.*

In the Crépin Herbarium, in Brussels, there are several specimens of the rose to be seen, including the following:

1st sheet: 'The original Collett specimen 1888. collected in the Shan Hills between Burma and Slam.'

2nd sheet: 'Rosa khongui(?) Munipur 6000 feet. April 1882. Colleced by G. Watt'

3rd sheet: Abbe Delavayi found *R. giganlea* in Yunnan, 1890 March. Pinkish white.

M. François Crépin was also closely associated with the other most distinctive Indian rose species, R. clinophylla. More on this in the next rose annual.

Indian rose lovers should indeed be grateful to the Director of the Crépin Herbarium, in the National Botanic Garden, (NBG) Brussels, Belgium, for the careful preservation of these important historical records, of such great interest to us. We are most grateful to Mr Ivan Louette, our Belgian friend who took us to the NBG and introduced us to the people in charge: and to the authorities at the National Botanic Garden for their ready assistance in tracing the records reproduced in this article when we visited the Herbarium in June 2003.

We are grateful to Mr Gene Waering for his assistance, and to Mr Brent C.

Dickerson and Mr Pierre Rutten for their translation of M. Crépin's original papers from French to English.

To conclude on a personal note, Ivan Louette, who was escorting us in the N.B.G., told us, when we were in the elevator going up from the Herbarium, that he was taking us to meet a most important person. I hastily patted my hair (or what is left of it) in place, but seeing this, Ivan assured me that the V.I. P. was not one for formalities. When the elevator stopped and we got out, Ivan led us, to our surprise, to the striking marble bust of François Crépin!! (see photograph). A practical joke, but a most appropriate way to end our visit to the Herbarium.

Copies of the original articles:

1. Bulletin de la Société royale de botanique de Belgique, 1889, pgs. 11 - 14
2. The Gardeners' chronicle: a weekly illustrated journal of horticulture and allied subjects, 1905, pgs. 136 + 144/5
3. The Gardeners' chronicle: a weekly illustrated journal of horticulture and allied subjects, 1912, pgs. 314, 315

M. Crépin lit la notice suivante :

NOUVELLES OBSERVATIONS SUR LE ROSA GIGANTEA COLLETT,

par François Crépin.

Depuis que j'ai décrit le ***Rosa gigantea*** Collett[1], j'ai pu examiner de nouveaux matériaux de cette espèce qui me permettent de compléter ma première description. En outre, j'ai reçu de M. le général Collett quelques renseignements utiles à faire connaître.

Dans une lettre qu'il m'adressait de Meiktites (Haut Burma), à la date du 29 juillet dernier, ce botaniste m'informe qu'il a trouvé le ***R. gigantea*** près des villages de Myromati, Pwehta, Kalow, Koni, etc., situés dans le district de Myelat (Haut Burma), vers la latitude de 20° 40′ N. et la longitude de 96° 30 E., à une altitude entre 4000 et 5000 pieds. L'espèce n'est pas commune, mais elle n'est toutefois pas rare, puisqu'elle a été observée, par mon correspondant, à 14 ou 15 endroits différents dans le district de Myelat. Ses tiges, qui peuvent atteindre jusque 30 et même 40 pieds de longueur, grimpent sur les rochers, sur les arbres et dans les buissons.

Dans la région des Shan Hills, où croit le ***R. gigantea***, les gelées sont à peu près inconnues, ce qui nous indique assez que cette Rose devra être, dans l'Europe centrale,

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(1) Voyez *Compte-rendu de la séance du 2 juillet 1888 de la Société royale de botanique de Belgique*, Bull., t. XXVII, 2e partie, pp. 146-150.

plus ou moins protégée contre le froid de nos hivers, ou être cultivée dans des endroits bien abrités.

La lettre de M. Collett était accompagnée d'un échantillon défleuri couronné par un réceptacle déjà fortement grossi (12 mill. de diamètre). Ce réceptacle, à parois épaisses, était d'une extrême dureté, quoiqu'il eut été recueilli au mois d'avril (1888); il ne renfermait encore que de très jeunes ovaires.

L'échantillon, constitué d'un simple ramuscule, est complètement inerme comme ceux que j'avais antérieurement décrits.

J'avais demandé à M. le général Collett si le *R. gigantea* est toujours à inflorescence uniflore et si la tige est armée d'aiguillons. Il me répondit qu'il y a certainement des aiguillons et que les inflorescences sont uniflores, sans toutefois pouvoir assurer qu'elles le soient toujours.

Au mois de novembre dernier, j'ai eu l'occasion, bien inattendue assurément, d'enrichir mes connaissances sur la nouvelle espèce du Burma. Dans un envoi de Roses à déterminer que me faisait le Musée botanique de Berlin, se trouvent 6 spécimens d'une espèce recueillie par M. G. Watt accompagnés de l'étiquette suivante : « 6320. Rosa.... Khongui. 6000ft. April 1882 ». L'un des échantillons porte, attaché à un brin de fil, une petite étiquette portant : « Field. n° 6404. Herb. G. Watt ». Ces 6 échantillons ne sont rien autre que le *R. gigantea !* Les 9 inflorescences de ceux-ci sont toutes uniflores, chacune d'elles accompagnée à sa base d'une feuille 1-3-5-foliolée. Les axes des ramuscules sont ordinairement inermes, présentant rarement de 1 à 3 petits aiguillons crochus. Sur un robuste fragment de tige, se trouvent des aiguillons assez nombreux, épars, courts, épais et fortement crochus, rappelant plus ou moins ceux du *R. arvensis* Huds.

Soupçonnant que l'herbier de Kew pouvait renfermer des échantillons du même collecteur, je m'empressai d'écrire à M. Nicholson en le priant de bien vouloir faire des recherches. Celui-ci, avec son obligeance habituelle, me répondit immédiatement que dans les collections de Kew, il existe deux feuilles d'herbier de ce type : l'une avec l'étiquette : April 7th 1882 at Khongui, l'autre avec l'étiquette : At Sirohfurar on April 11, 1882, 5-6000 ft.

Cette Rose avait reçu le nom manuscrit de ***Rosa** macrocarpa* Watt. Sur la première feuille, l'une des inflorescences est 3-flore, les autres sont uniflores; sur la seconde feuille, toutes les inflorescences sont uniflores.

Le nom de *macrocarpa* est probablement justifié par la grosseur du fruit de cette espèce. Dans l'herbier du Musée de Berlin, il y a deux fruits dont l'aspect fait supposer qu'ils étaient d'une année antérieure à la récolte des spécimens florifères. Ils sont largement ovoïdes et mesurent de 15 à 18 mill. de diamètre. Les sépales, qui paraissent être réfléchis après l'anthèse et pendant la maturation, avaient disparu (1).

La découverte de M. G. Watt élargit considérablement l'aire de dispersion du *R. gigantea*, puisque la province de Munipur ou Manipur, où ce collecteur l'a observé, est à plus de 5° N. des Shan Hills du Burma. Peut-être cette remarquable espèce s'étend-elle vers l'est jusque dans les provinces sudo-occidentales de la Chine.

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(1) Pendant l'impression de cette notice, j'ai reçu de M. G. King, directeur du Jardin botanique de Calcutta, deux fruits mûrs du *R. gigantea*, avec 36 akènes, qui ont été semés. Ces fruits sont gros, pyriformes, à peu près aussi larges que longs (23 à 24 milimètres), à parois très épaisses, dont la chair, en se desséchant, devient très dure et cornée, à cavité ovarienne relativement très petite. Les sépales sont réfléchis et paraissent persistants. Les akènes sont très gros ; ils mesurent 6 à 7 mill. de longeur sur 5 à 7 mill. de largeur.

(*Note ajoutée pendant l'impression.*)

Avec ces nouveaux éléments d'appréciation, on peut, dès maintenant, considérer le *R. gigantea* comme étant bien distinct du *R. indica.* Il reste à voir si l'on peut comprendre cette nouvelle espèce dans la section des *Indicae* telle que je l'ai entendue jusqu'ici. Je ne me crois pas être encore en mesure de prendre une décision à cet égard.

Dans ma première notice sur le *R. gigantea*, j'avais comparé cette espèce à la Rose cultivée sous le nom de *Fortune's Double Yellow.* Aujourd'hui, l'affinité de ces deux Roses me paraît plus étroite et je ne serais pas très surpris si l'avenir venait nous autoriser à réunir ces deux formes sous le même nom spécifique(1).

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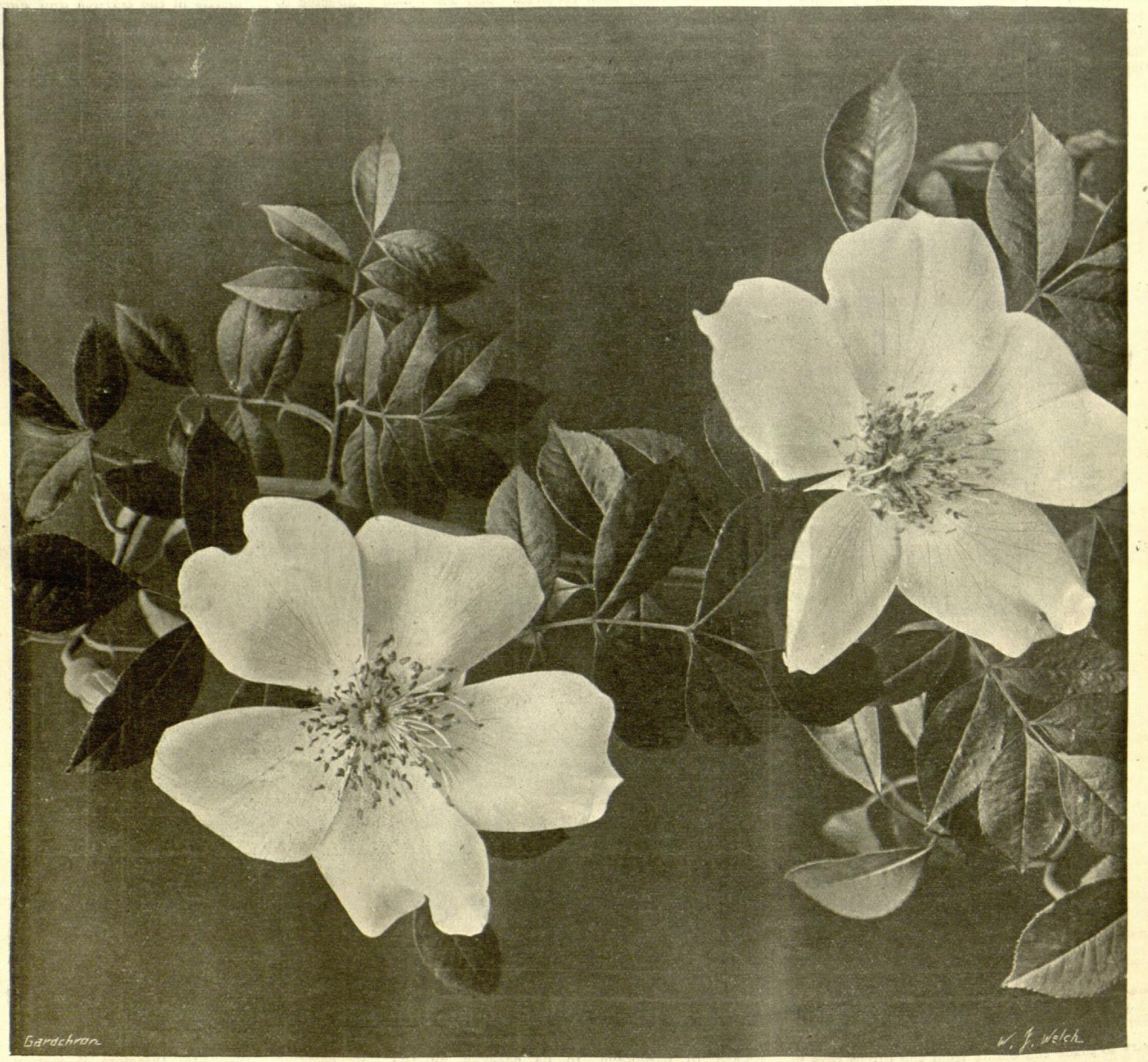
(1) Dans un article intitulé : *Rose jaune de Fortune*, publiée dans le *Journal des Roses*, année 1882, pages 173-176, Germain de Saint-Pierre considère la *Fortune's Double Yellow* comme une véritable espèce, à laquelle il rapporte la *Beauty of Glazenwood* à titre de synonyme. Il propose de lui donner le nom de *Rosa amabilis.* Il est à remarquer que ce nom d'*amabilis* avait déjà été appliqué par Wrede à une Rose cultivée, devenue plus tard une variété du *R. perfecta* Wrede; M. Gandoger, dans ses *Tabulae rhodologicae*, 1881, p. 203, n° 2838, a également donné le nom d'*amabilis* à une forme du groupe du *R. canina.*

ROSA GIGANTEA.

The flowering of this remarkable Rose at Kew in the spring of 1910 (see *Gardeners' Chronicle* June 4, 1910, p. 370) was an event which had been looked forward to ever since its introduction into cultivation by General Sir Henry Collett, in 1889. At the present time it is again in flower in the Himalayan wing of the Temperate House, where it is planted out in a border amongst Himalayan and other tender Rhododendrons, and has climbed high up amongst the rafters and iron girders of the roof to a height of about 40 feet. At such a distance from the ground the beauty of its flowers cannot be perceived, but a spray is reproduced in fig. 156 showing the flowers, which are from 4 to 5 inches in diameter, smaller than natural size. In the bud stage the colour is a rich copper, similar to W. Allen Richardson; this shade, however, fades rapidly as the bloom expands until, when it has been open a day or two, the colour becomes ivory-white. The stamens are a bright yellow. The calyx lobes measure an inch in length, but there are specimens in the Kew Herbarium in which the lobes are even longer than this. A remarkable feature of the plant is its extraordinary vigour and the enormous amount of growth which it has made in former years. Some of the original seedlings raised from seed collected by General Collett in the Shan States were planted in several of the large houses at Kew in borders of prepared soil, and quickly made large specimens. Some of the shoots grew as much as 30 feet long. A large specimen was grown for 10 years or so in the Succulent House, where it grew rampantly. During the summer and autumn the lights on the roof were let down and the plant exposed to all the sun and light possible, being afterwards tied down close to the glass and subjected to the dry conditions of the other inmates of this house during the winter. Other specimens were grown in the main building of the Temperate House, as well as in the Mexican and Himalayan wings. The temperature of each of the houses except that of the Himalayan wing, was sufficiently high to cause the plants to continue in growth all the year round, but in the Himalayan wing the plant obtained a rest of a few months during winter. The temperature of this house is never allowed to fall more than a few degrees below freezing point. When originally planted in this house in 1899 the plant grew rapidly in the rather stiff loamy soil of the border. The soil, however, did not suit many of the other occupants of the house, and in 1906 it was replaced with a sandy peat. This has had a marked effect upon the rate of growth of the Rose, the stems being much more slender and the growth more twiggy generally. It is to the change of soil that I attribute the flowering of the Rose, and not the the hot summer of last year, for it produced flowers last year after the wet and cold summer of 1910. Cultivators would do well to try the effect of planting this Rose in a poor soil or where the roots may be restricted. They should also try the effect of a low temperature during the winter.



[Photograph by C. P. Raffill.

FIG. 156.—ROSA GIGANTEA, FROM A PLANT IN FLOWER IN KEW GARDENS: FLOWERS COPPERY-RED, PASSING TO WHITE.

A full account of the discovery and history of Rosa gigantea is given in the *Gardeners' Chronicle*, March 4, 1905, p. 136. The figure in the *Botanical Magazine*, tab. 7972, does not convey any adequate idea of the beauty of the flowers, which are depicted as being of a dirty, greenish white.

The plant was originally discovered by Dr. Watt in 1882 during the Government demarcation survey in Manipur at altitudes of 5-6,000 feet. It was later discovered by General Sir Henry Collett in the Shan Hills, Upper Burmah. It has since been collected by Dr. Henry, Mr. W. Hancock, and recently by Mr. George Forrest in North-West Yunnan, China. Mr. Forrest has discovered specimens with rose-coloured flowers, which have been described as variety erubescens by Focke in *Notes of the Royal Botanic Gardens, Edinburgh*, v., p. 68. The variety was found in shady situations in the Lang-kong, Hocking, and Lichiang valleys, and is described by Mr. Forrest as "a semi-scandent scrub of 10-20 feet, with rose-pink, fragrant flowers." Whilst this plant closely resembles Rosa gigantea in many respects, notably in its calyx lobes and in several minor details, I am of the opinion that it is distinct. The fruit and seed, which are important characters in determining Roses, are wanting in the herbarium material of Focke's plant, and I have little doubt but that, when these are obtained, the plant will prove to be distinct.

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AN ITALIAN GARDEN.

On a projecting spur of the lower Fiesole Hills, some two miles east of Florence, stands the old Castello di Poggio Gherardo, once a mediæval fortress, now a modern residence—so far as its interior is concerned—and surrounded by a very charming garden. The estate was purchased in 1889 by the late H. J. Ross, Esq., an enthusiastic horticulturist, who had spent many of his early days in the East, and who made it the home of one of the finest collections of Orchids that has ever been brought together in Italy. This collection is in part maintained by his widow, Mrs. H. J. Ross. The place was graphically described a few years ago by a niece of Mr. Ross. "Animals and plants all thrive at Poggio Gherardo in a remarkable way, because much love is lavished on everything within its walls. The Wistaria grows at such a pace that it threatens to pull down the terrace staircase; the Camphor tree and Eucalyptus battle valiantly through severe winters, and rare southern plants are enticed to show their bloom. As for Roses, they tumble in great cascades over the walls above the carriage drive, mixing their pink and white blossoms with the yellow Banksia and pale or dark-blue Irises. Away from the wall the monthly Roses form thick hedges winding up the hill towards the house, near where they merge into a spinney of Pines, Chestnuts, Cypresses, Bays, Laurels, Vines, and Arbutus. Above it all arises the square crenelated fortress villa, which withstood the arms of Hawkwood and his Pisan soldiers, survived even earthquakes, and after more than 500 years still stands proudly on a spur of the Fiesole hills full in sight of the Arno Valley."

The house is approached through a grove of Vines and Olives by a long, steep, winding drive, bordered with hedges of Roses, which, in the first fortnight of May, when the writer had the pleasure of staying there for some days, on the occasion of the International Horticultural Exhibition at Florence, were covered with thousands of pink blossoms. Roses luxuriate everywhere; yellow, white and red, single and double, on pergolas and arches, fences, tree trunks, and walls, forming a wealth of floral tracery, and the double white and yellow Banksians recalled our own Crimson Ramblers in their wealth of flowers. One must visit the sunny South to see the Banksian Roses in perfection. Lizards abound; one sees them everywhere in the sunshine, where the Caper plant luxuriates in the fissures of the old walls, on stony banks and amongst the Roses, whence they emerge to stalk the flies when one remains quiet for a few moments.

Among many familiar scenes there is much that is novel. Large blue bees flit about amongst the flowers; blue, red, and yellow dragon-flies, and many kinds of butterflies—white, brimstone, deep yellow, blue, and red—impart a gaiety to the scene, while the beautiful swallow-tail butterfly floating gracefully in the sunshine furnished a sight to be remembered. And in the evening, when the garden is cool and delightful after the burning sunshine, the place was harmonious with nightingales—indeed, one may both hear and see them in the day-time in the adjoining woods. The fire-flies, again, afforded a surprise. On a May evening, a soft flash was noticed that for a moment recalled the flash of an electric wire. But there were no wires, and quickly came a second flash, which left no doubt of the cause. Soon there were dozens, and during the next few nights, after which the writer bade them a regretful farewell, the groves were lighted as by myriads of fairy lamps, not stationary, as our own glow-worms, but flashing everywhere, and affording a sight never to be forgotten.

The situation slopes to the south, in full exposure to the sunshine, and many plants thrive in the open which in this country require to be grown indoors. One of the first things noticed was the Lemon trees, planted in large tubs, and bearing fruits in various stages, as well as flowers. They are, however, brought inside for protection during the winter, as is usually practised in this part of Italy, for the proximity of the Apennines renders the climate cold in winter. Near by were two Kaki trees in bud; the larger is an immense tree which bore 450 fruits the previous year. The fruits are gathered and put in a fairly warm place to ripen, when they are delicious, as I have since had the opportunity of proving. There is also a large tree of Eucalyptus globulus in perfect health, and an immense Camphor tree (Cinnamomum Camphora), which is one of the economic trees of Southern Italy. Melia Azedarach is another large tree, bearing panicles of purple flowers and numbers of old fruits. The specimen is only 16 years old, and was 5 feet high when planted, so rapidly does everything grow in this genial climate. Paulonia imperialis is a large tree, and purple with its beautiful blossoms. Nerium Oleander forms an immense old bush, and the Japanese Loquat fruits every year. There are many fine old specimens of Chamærops Fortunei, both male and female, producing large panicles of flowers.

Magnolias thrive, and a number of Azaleas of various kinds and colours were covered with flowers, while a few Rhododendrons were also in bloom. Numerous plants of Pæonia Moutan are grown. The Wistarias, both blue and white, flower in the greatest profusion, and with them on the house is a fine plant of Trachelospermum jasminoides, already in bud, and promising a fine display of deliciously fragrant white flowers. Solanum jasminoides covered an old arbour with a profusion of flowers. Sweet Peas were flowering in abundance, and many other plants, more or less familiar at home, are grown very successfully. I have already referred to the Roses: there is a fine plant of Marechal Niel, which, from the size of the stem, must be many years old; it flowers profusely. The Austrian Briar looked a picture, with its peculiar coppery red and yellow flowers on the same bush, and the Persian double-yellow Rose was a mass of blossoms. There is also a large single red Rose which blooms most profusely; its name is not known, but it is said to be used as a stock in Lombardy.

The Orchids are contained in five large houses, with various stove plants, and consist almost entirely of warm-growing kinds, for cool Orchids cannot be grown successfully in such a climate. Cypripediums, Vandas, and others of the Aërides group, Dendrobiums, Cattleyas and allies, Cœlogyne cristata, Stauropsis Batemaniana, Sobralia macrantha, and numerous others are grown successfully. Plants of Cœlogyne Dayana were wreathed in flowers. Many hybrid Cypripediums have been raised. A detailed account of the collection of Orchids was given in *Orchid Review*, 1911, pp. 202-205. In a wood behind the house numerous handsome plants of Orchis purpurea were in bloom; they are indigenous, and have probably grown there from time immemorial. The place must have been in the possession of the Gherardo family for hundreds of years, for there is an old monument erected to the memory of Bartolommeo di Gherardo Gherardi, magistrate of the Republic of Florence from 1390 to 1409.

The Olive is grown largely on the hill-sides; there are trees in the district which are hundreds of years old, and in some cases the trunks divide by the decay of the centre, forming what at first looks like a group of separate trees. They are pruned to what may be termed cup shape, the centres being left hollow, so as to admit all the sun, light, and air possible. The Olive is harvested in November and December, and the Olive oil produced by Mrs. Ross has become celebrated for its quality and purity. The vines are trained on the Maple, because this tree will submit to the severest pruning, and thus admit the maximum of light and air which are so essential to the proper ripening of the Grapes. In Lombardy the Elm is largely used for this purpose. It may be added that the prunings from the Vine, Olive, and Maple furnish the firewood of the peasantry in winter.

By the side of the drive is a row of the purple-leaved Prunus Pissardii, which forms a handsome tree and fruits freely, and the fruit is excellent for stewing, so that the tree is interesting both from an ornamental and a utilitarian standpoint. *R. A. R.*

FLORISTS' FLOWERS.

SWEET PEA NOVELTIES AT THE R.H.S. SHOW.

At the meeting of the Royal Horticultural Society, on April 30 last, two fine collections of Sweet Peas were staged, both showing skilful culture under glass. Mr. C. W. Breadmore, Winchester, had, in Princess Mary, a novelty with rather a sensational combination of colouring, mauve and blue, reminding one somewhat of Afterglow, without that variety's tendency to doubling. Aggie Elder is a distinct new shade of Rose, a flower of good form and substance. Messrs. Dobbie & Co., Edinburgh, seem to have adopted a new method of naming, as three fine novelties on their stand were named respectively Scarlet (very brilliant), Cream, and Lavender (a true, pure lavender, without any mauve shading). A bunch which attracted much notice was labelled Lavender George Herbert—Fixed Stock. This will, if the best type of it is really fixed, be a great favourite with exhibitors, who know its value. *Visitor.*

APPOINTMENTS FOR THE ENSUING WEEK.

SATURDAY, MAR. 4 { Société Francaise d'Horticulture de Londres Meeting.

SALES FOR THE WEEK.

MONDAY NEXT—
Herbaceous Plants, Perennials, Azaleas, Roses, Liliums, &c., at 67 and 68, Cheapside, E.C., by Protheroe & Morris, at 12.

WEDNESDAY, NEXT—
Palms, Plants, Azaleas, Rhododendrons, Liliums, Roses, Fruit Trees, Border Plants, &c , at 67 and 68, Cheapside, E.C., by Protheroe & Morris, at 12 o'clock. —Cases of Lilies from Japan, Azaleas, Roses, &c., at Stevens' Rooms. at 12.30 P.M.

FRIDAY NEXT—
Hardy and Herbaceous Plants, Roses, Azaleas, North American Plants, Liliums, &c., at 67 and 68, Cheapside, E.C., by Protheroe & Morris, at 12.—Imported and Established Orchids, at 67 and 68, Cheapside, E.C., by Protheroe & Morris, at 12.30.

(For further particulars see our Advertisement columns.)

AVERAGE TEMPERATURE for the ensuing week, deduced from observations of Forty-three Years at Chiswick —41·4°.

ACTUAL TEMPERATURES :—
LONDON.—*Wednesday, March* 1 (6 P.M.): Max. 44°; Min. 35°.
Gardeners' Chronicle Office, 41, Wellington Street, Covent Garden, London.—*Thursday, March* 2 (10 A.M.): Bar., 29·9; Temp., 42°. Weather—dull, with occasional sunshine.
PROVINCES.—*Wednesday, March* 1 (6 P.M.): Max. 43°, W. Coast of England; Min. 40°, Scarborough.

Rosa gigantea. *(See Supplementary Illustration.)*

IN 1889 we received from Sir GEORGE KING, then the Director of the Calcutta Botanic Garden, some seeds of this noble Rose, which were distributed among those likely to succeed in its culture. Probably seeds were distributed from other sources also. Mr. GEORGE PAUL informs us that he raised seedlings from this Rose, but that they damped off; and the same fate befell others raised by Mr. LEACH. Some disappointment has been felt at the circumstance that while the Rose grows with the greatest freedom, as at Kew and elsewhere, flowers have only very rarely been produced. Eventually in 1898 Lord BROUGHAM had the satisfaction of flowering the plant in his garden at Cannes. In his "List of Roses now in cultivation at the Château Eléonore at Cannes," published in 1898, his lordship mentions the plant as having flowered in his garden for the first time in Europe last month [April, 1898, presumably]. He gives a photographic representation of it, and describes it as—

"A splendid plant, making growths of 40 feet or more, with rambling branches armed with irregular prickles of moderate size, often in pairs at base of leaves, which are about 3 inches long and glabrous. The flowers are solitary, about 6 inches in diameter—which size will not unlikely be increased when the plant is older and stronger, of a golden-white with yellow centre containing an unusual quantity of pollen. Petals large, broad, imbricated; disc large, styles much exserted, free, villous; stamens long. The most desirable and by far the finest single Rose I have ever seen. It does not seem to be very hardy and is subject to mildew [as it is also here]. The bud is long, larger, but very closely resembles that of Madame Marie Lavallée, and of a pure gold colour. This Rose when in flower should obviously be shaded, as the sun soon extracts the gold from the blooms, leaving behind a substitute of dirty white. At a short distance the flowers bear a close resemblance to a Clematis."

Mr. F. CANT, of Colchester, also succeeded in flowering it, but with such indifferent results that he discarded the Rose as useless for his purposes.

Then came Mr. LEACH, the gardener to the Duke of NORTHUMBERLAND at Albury, Surrey, who succeeded in 1903 in inducing the plant to produce two flowers, the first of which was just on 6 inches across. In February, 1904, the same specimen produced about a dozen flowers, and this year Mr. LEACH had the satisfaction of seeing twenty-eight blooms on his plant, some of which were exhibited at the Royal Horticultural Society on Tuesday last, and secured for the exhibitor the award of a Cultural Commendation and a Botanical Certificate. Mr. LEACH cultivates the plant in a Peach-house, and the shoots are trained down on the wires.

The colour of the flowers exhibited was ivory-white, and the foliage showed one more pair of leaflets to each leaf than is represented in our illustration. A good figure is given in the *Botanical Magazine*, t. 7972 (September, 1904), where the flowers are shown of a pale-primrose-yellow colour, whilst the bud has the golden colour mentioned in Lord BROUGHAM'S description. There is no doubt whatever from the glowing descriptions given by travellers, and such evidence as we now have, that this is indeed a grand Rose and amply deserved the award made to it. In due time we doubt not we shall discover some means of inducing the plant to flower more freely. Up to the present, as Mr. HEMSLEY says, "every possible method of propagation has been tried ineffectually in order to obtain flowers more freely in this country, yet it flowers profusely on the Riviera."

Sir GEORGE WATT was the first to discover this Rose (in Manipur), but the name R. gigantea was first published by the late Sir HENRY COLLETT, who found the plant in the Shan Hills, Upper Burmah. More recently it has been found in South-Western China by Dr. HENRY and others. We may therefore expect considerable variation, whilst the colour of the flowers, about which there has been a diversity of statement, would naturally differ according to varying conditions and diverse stages of growth. Sir GEORGE WATT mentions that the fruit is edible, as large as a small Apple, and that it is sold in the bazaars of Manipur State.

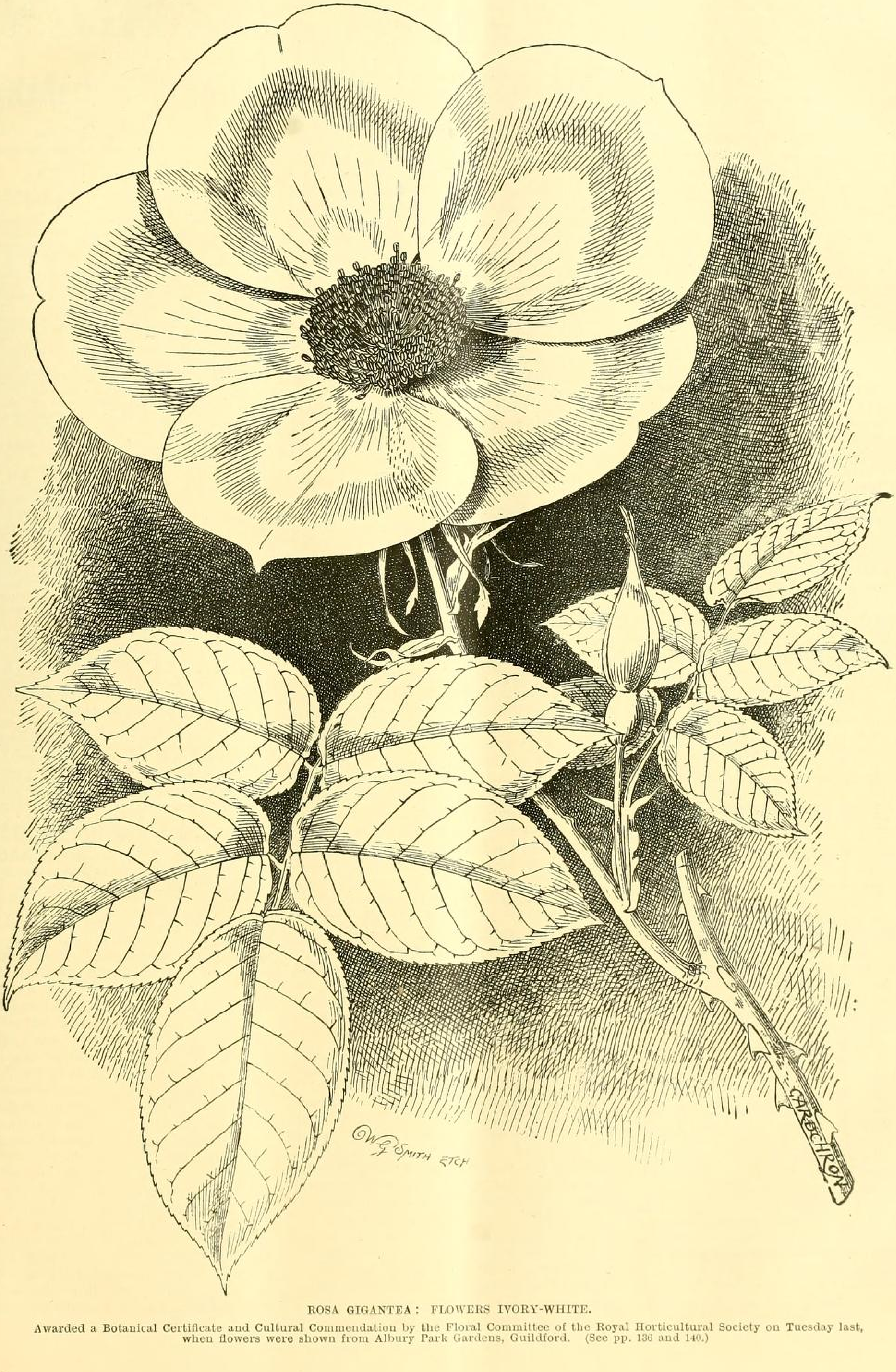
Mr. FITZHERBERT, in our own columns, May 2, 1903, p. 278, mentions the species as hardy in South Devon; and we have heard of it as grown on an outside wall at Reigate, Surrey.

RHODODENDRONS AT SINGLETON, NEAR SWANSEA, AND AT PENLLERGAER.—Some very fine specimens of Himalayan Rhododendrons may be seen in the Singleton Abbey grounds, belonging to Lord SWANSEA. The specimen shown in fig. 57 is a natural hybrid between R. Falconeri and R. niveum, raised from seed sent to Singleton by Colonel SYKES, who commenced his first expedition to the Himalayas in about the year 1848. The tree is 30 feet high, and 20 feet in diameter across the branches. At the time our photograph was taken the plant had 200 heads of flowers, which in size are very similar to those of R. Falconeri, but they are tinged with lilac colour when they first open, passing afterwards to white or nearly white. Mr. JAMES HARRIS, whose photograph appears in the illustration, was gardener at Singleton for many years, and has now a nursery at Blackpill in the immediate neighbourhood. Among the most notable Rhododendrons at Singleton is R. barbatum, 37 feet high and 15 feet through. This tree is wonderful and its effect handsome, even in winter, but when in flower the sight must be one worth a long journey to see. It generally produces about 400 heads of flowers. Of R. Falconeri there is one specimen 28 feet high and 15 feet through, which has produced on one or more occasions as many as 200 heads of flowers. We had the pleasure of visiting Singleton in January, and these marvellous Rhododendrons, so large that their individual characters are well developed, provided us with an unusual treat, the foliage of R. barbatum and other species being so handsome that the absence of flowers was of less consequence than one would have expected. There is also a good Pinetum at Singleton, which contains many fine specimens, including Tsuga Mertensiana (Albertiana), 110 feet high. Lord SWANSEA having resided abroad for the past three years, Singleton is only inhabited by caretakers, but we are glad to find that although little brushing up and such-like work is done in the gardens, the trees are looked after by Mr. HARRIS, who is still retained for this purpose by Lord SWANSEA. The extraordinary climate at Singleton is shown by the fact that we were able to gather beautiful flowers of Grevillea rosmarinifolia on January 14 from a plant growing on the Castle walls exposed to the weather. From Singleton we drove to Penllergaer, the residence of Sir JOHN T. LLEWELYN, Bt. In the beautiful and extensive gardens there Sir JOHN has an exceedingly rich collection of Rhododendrons, including most of the Himalayan species that are hardy in South Wales. The natural undulations at Penllergaer, the immense lake and other features, are remarkable, and the spot is an ideal one for the cultivation of Rhodendrons and Bamboos, which Sir JOHN has made his special favourites. The magnificent Bamboos are a revelation to those who have never seen the effect they are capable of producing in favourable localities, where care is given to the selection of positions in which the plants will have the benefit of shelter. Mr. WARMINGTON, the gardener at Penllergaer, has been at the place so long he has seen most of the rarer plants grow up, and evidently shares the enthusiasm his employer has for their cultivation.

ROYAL HORTICULTURAL SOCIETY'S EXAMINATIONS FOR SCHOOL TEACHERS, 1905.—The Royal Horticultural Society will hold an examination in Cottage and Allotment Gardening on Wednesday, April 5, 1905. This examination is intended for, and will be confined to, Elementary and Technical School Teachers. The general conduct of the examination will be on the same lines as that of the more general examination, except in obvious points to which they would not apply. Intending candidates are requested to send in their names early in March. A Silver-gilt Flora Medal will be awarded to the candidate gaining the highest number of marks, and each candidate will receive a Certificate of the class in which he has passed.

—— GENERAL EXAMINATION.—The Society's Annual Examination in the Principles and Practice of Horticulture will be held on Wednesday, April 12, 1905. A copy of the syllabus, covering both examinations, will be sent to any person on receipt of a stamped and directed envelope. Questions set at the Royal Horticultural Society's Examinations, 1893—1904, may also be obtained at the Society's Offices, Vincent Square, Westminster, price 1s. 6*d*.

UNITED HORTICULTURAL BENEFIT AND PROVIDENT SOCIETY.—The annual general meeting of this Society will be held at the Caledonian Hotel, Adelphi Terrace, Strand, W.C., on Monday, March 13, 1905, at 8 P.M. Mr. W. P. WRIGHT will preside.



ROSA GIGANTEA: FLOWERS IVORY-WHITE.

Awarded a Botanical Certificate and Cultural Commendation by the Floral Committee of the Royal Horticultural Society on Tuesday last, when flowers were shown from Albury Park Gardens, Guildford. (See pp. 136 and 140.)

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Copies of the original

Indian Rose Annual 2005

Francois Crepin and the Discovery of *rosa gigantea*

M.S.Viraraghavan

It was the 2nd of June 1888 when M. Francois Crepin received the first specimen of *R. gigantea* collected by General Sir Henry Collett in Burma (now called Myanmar). Crepin's observations are best detailed in his own words:

Extract of the Report of the July 2. 1888 Session of the Belgian Royal Society of Botany Bulletin, Volume XXVII, 2nd part....

"DESCRIPTION OF NEW ASIATIC ROSE, By Francois Crepin, Director of the National Botanical Garden, Brussels.

Last June 2nd, Mr David Prain, Conservator of the Seebpore Botanical Garden, near Calcutta, sent me four beautiful flowering branchlets of a rose collected by General Collett in the Shan Hills between the Kingdom of Burma and the Kingdom of Siam. Mr Prain, in a letter accompanying the specimens, said that Mr. Collett himself described this rose as a magnificent species, sprawling over rocks and climbing into trees, having a pure white flower 5 inches in diameter.

If the species is new, Mr Collett himself wishes to give it the name: Rosa gigantea. To judge by the specimens I received, this rose is truly magnificent and it appears to be very vigorous; its corolla is certainly the largest one to be found among single rose flowers.

It is known that, in R. Indica Auct., the inflorescecence is nearly always multi-flowered and provided with bracts. So if one assumes that R.gigantea ordinarily has a multi-flowered inflorescence and that the single is the exception, one would probably be right to classify it in the Indicae section.

It remains to be seen if the species is remontant as is R. Indica.

While awaiting additional information, I will give a description of this rose that admits it provisionally as a species.

Hillview, Fernhill Road, Kodaikanal - 624 101, Tamil Nadu

Rosa gigantea Collett Mss. (Sect. Indicae?)

Unifloral inflorescence, usually without bracts, trifoliate leaves; thick smooth pedicel; ovary large, ovoid, attentuated towards the two extremitites, glaucescent, smooth; flower bud large, ovoid elongate (4 cms to sepals' end); sepals very long and entire, tapering from the base to the summit, slightly dilated at the tip, whitish pubescent on the internal face and along the sides, which have fine glands reflexing at anthesis. One completely spread out corolla measured 12 centimetres in diameter!

This rose is unpublished and appears to constitute a distinct species. In my opinion it should be classified as being closely related to R. indica Auct. non L. (1). Does it belong in the section that I named Indicae? This is quite possible but I would need supplemental information to be able to decide this question.

Whatever the case, General Collett's discovery is worth bringing to the attention of scientists and rose fanciers (amateurs). If any one succeeds in introducing R. gigantea into Europe, and in growing it, it will enrich choice collections by its enormous corolla and beautiful foliage; moreover it will be, by crossing it with other species, the source of hybrid products probably superior to those of R. indica."

It is evident from the above that M. Francois Crepin was no mere taxonomist. He was obviously a lover of roses, which is far more important from the rose fancier's point of view. Subsequently, the question whether R. gigantea was indeed a new species and the fact that it was also to be found in India (Manipur) was confirmed.

Let us again reproduce Crepin's own words from the Extract of the Report of the January 12, 1889 Session of the Belgian Royal Society of Botany Bulletin, Volume XXVIII, 2nd part, para 14.

"NEW OBSERVATIONS ON ROSA GIGANTEA COLLETT"

by Francois Crepin

Since I first described Rosa gigantea Collett (1), I have been able to examine some new materials that allow me to complete the earlier description. Besides what I received from General Collett, I also obtained some pieces of information it would be useful to know.

(1) See Extract of the Report of the July 2nd 1888 Session of the Belgian Royal Society of Botany Bulletin, Vol. XXVII, 2nd para, Pgs 146-150.

In a letter to me which he wrote at Meiktites (High Burma) dated July 20th, the botanist informed me that he found R. gigantea in villages of Myromati, Pwehla, Kalow, Koni, etc., that are located in Myelat district (High Burma) latitude: N 20 '40' Longitude E 96'30', at an altitude between 4000 and 5000 feet. The species even if uncommon, is not rare, as it was observed by my correspondent in 14 or 15 different places in Myelat district. Its canes that may reach 30 and even 40 feet long, climb on rocks, trees and shrubs.

In the Shan Hills district where R. gigantea grows, frosts are almost unknown, suggesting that this rose should be at least in central Europe some what protected against our winter's frost, or grown in well sheltered places.

With Mr Collett's letter was a deflorate specimen crowned by a much swollen receptacle (diam:12mm). This thick walled receptacle was extremely hard although gathered in April (1888) and still contained very young ovaries.

The sample, composed only of a secondary branch is totally unarmed, as were the previously described ones.

Earlier, I had asked the General whether the R. gigantea inflorescence was uniflorous, and whether its stems are armed with prickles. He answered that indeed there are prickles, and that the inflorescences are uniflorous, but was unable to affirm that it was always so.

Last November, I had the unexpected opportunity to learn more about the new species from Burma. In a parcel of roses sent to me for identification by the Berlin Botanical Museum, there were six specimens of a species collected by Mr. G. Watt, with the following label: " 6320. Rosa.. Khongui. 6000 ft. April 1882'. Attached to one sample is a small label reading: 'Field n'6404. Herb. G Watt'. These six samples are none other than R. gigantea!!-of which the nine inflorescences are all uniflorous, each one accompamied by a basal 1-3-5 foliate leaf. Floriferous branches are usually unarmed, or, rarely, bear 1to5 small hooked prickles. On a robust length of stem will sometimes be found strongly hooked, thick, short, dispersed and rather numerous prickles more or less reminiscent of those of R. arvensis Huds.

Suspecting that the Kew Herbarium might contain other samples from the same collector, I hastened writing to Mr Nicholson, asking him to undertake some searches. Obliging as usual, he responded *inmmediately that in Kew's collections were two herbarium sheets of this kind: one labelled 'April7th 1882 at Kongui', the other labelled 'At Sirohfurar on April 11th 1882, 6000ft'. In a handwritten note, this Rose is referred to as Rosa macrocarpa watt. On the first sheet, one inflorescence is triflorous the others are uniflorous; on the second sheet, all the inflorescenes are uniflorous.*

The name macrocarpa is probably justified by this species' fruit size. In the Berlin Museum Herbarium, there are two fruits the look of which makes one think that they were one year old when the blooming samples were gathered. Broadly ovoid, their diameter measures from 15 to 18 mm. The sepals which were absent (in these materials) appear very reflexed post anthesis and during maturation.(1).

(1) While printing this notice, I received from the Calcutta Botanical Garden Director, M.G. King, two mature R. gigantea fruits with 30 achenes that were sown. These fruits are big, pyriform, about as wide as long (23to 24mm), walls very thick, the flesh of which when dessicated becomes very hard and horny, with the cavity of the ovary very small, relatively. Sepals reflexing and apparently persistent. Achenes very big:6.6 mm long by 5.7 mm wide. (Note added while in the press) Mr G Watt's discovery considerably widens R. gigantea's dispersion area since Munipur of Manipur province, where this collector observed it, is more than 5°'N from Burma's Shan Hills. Perhaps this remarkable species spreads east to south western Chinese provinces."

The next stage was the flowering of this great rose in Europe, which is described in vivid detail in the English gardening journal 'The Gardener's Chronicle" issues of March 4th 1905 and May 11th 1912 which are reproduced below.

The Gardeners'Chronicle, March 4th 1905

Rosa gigantea (see supplementary illustration)

"In 1889 we received from Sir George King then the Director of the Calcutta Botanic Garden, some seeds of this noble Rose, which were distributed among those likely to succeed in its culture. Probably seeds were distributed from other sources also. Mr. GEORGE PAUL informs us that he raised seedlings from this Rose, but that they damped off; and the same fate befell others raised by Mr. LEACH. Some disap-

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Mr. F. CANT of Colchester, also succeeded in flowering it, but with such indifferent results that he discarded the Rose as useless for his purpose.

Then came Mr. LEACH, the gardener to the DUKE OF NORTHUMBERLAND at Albury, Surrey, who succeeded in 1903 in including the plant to produce two flowers, the first of which was just on 6 inches across. In February 1904, the same specimen produced about a dozen flowers and this year Mr. LEACH had the satisfaction of seeing 28 blooms on his plant, some of which were exhibited at the Royal Horticultural Society on Tuesday last, and secured for the exhibitor the award of a Cultural Commendation and a Botanical Certificate. Mr. LEACH cultivates the plant in a Peach-house, and the shoots are trained down on the wires.

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THE GARDENERS' CHONICLE, May 11, 1912

ROSA GIGANTEA

"The flowering of this remarkable Rose at Kew in the spring of 1910 (see Gardeners Chronicle June 4, 1910, P. 370) was an event which had been looked forward to ever since its introduction into cultivation by General Sir Henry Collett, in 1889. At the present time it is again in flower in the Himalayan wing of the Temperate House, where it is planted out in a border amongst Himalayan and other tender Rhododendrons, and and has climbed high up amongst the rafters and iron girders of the roof to a height of about 40 feet. At such a distance from the ground the beauty of its flowers cannot be perceived, but a spray is reproduced in fig.156 showing the flowers, which are from 4 to 5 inches in diameter, smaller than natural size. In the bud stage the colour is a

rich copper, similar to W. Allen Richardson: this shade, however, fades rapidly as the bloom expands until, when it has been open a day or two, the colour becomes ivory white. The stamens are a bright yellow. The calyx lobes measure an inch in length, but there are specimens in the Kew Herbarium in which the lobes are even longer than this. A remarkable feature of the plant is its extraordinary vigour and the enormous amount of growth which it has made in former years. Some of the original seedlings raised from seed collected by General Collett in the Shan States were planted in several of the large houses at Kew in borders of prepared soil, and quickly made large specimens. Some of the shoots grew as much as 30 feet long. A large specimen was grown for 10 years or so in the Succulent House, where it grew rampantly. During the summer and autumn the lights on the roof were let down and the plant exposed to all the sun and light possible, being afterwards tied down close to the glass and subjected to the dry conditions of the other inmates of this house during the winter. Other specimens were grown in the main building of the Temperate House, as well as in the Mexican and Himalaya wings. The temperature in each of the houses except that of the Himalayan wing, was sufficiently high to cause the plants to continue in growth all the year round, but in the Himalayan wing the plant obtained a rest of a few months during winter. The temperature of this house is never allowed to fall more than a few degrees below freezing point. When originally planted in this house in 1899 the plant grew rapidly in the rather stiff loamy soil of the border. The soil, however, did not suit many of the other occupants of the house, and in 1906 it was replaced with a sandy peat. This has had a marked effect upon the rate of growth of the Rose, and not the hot summer of last year, for it produced flowers last year after the wet and cold summer of 1910. Cultivators would do well to try the effect of planting this Rose in a poor soil or where the roots may be restricted. They should also try the effect of a low temperature during the winter.

A full account of the discovery and history of Rosa gigantea is given in the Gardeners' Chronicle, March 4,1905p. 136. The figure in the Botanical Magazine tab. 7972, does not convey any adequate idea of the beauty of the flowers, which are depicted as being of a dirty, greenish white.

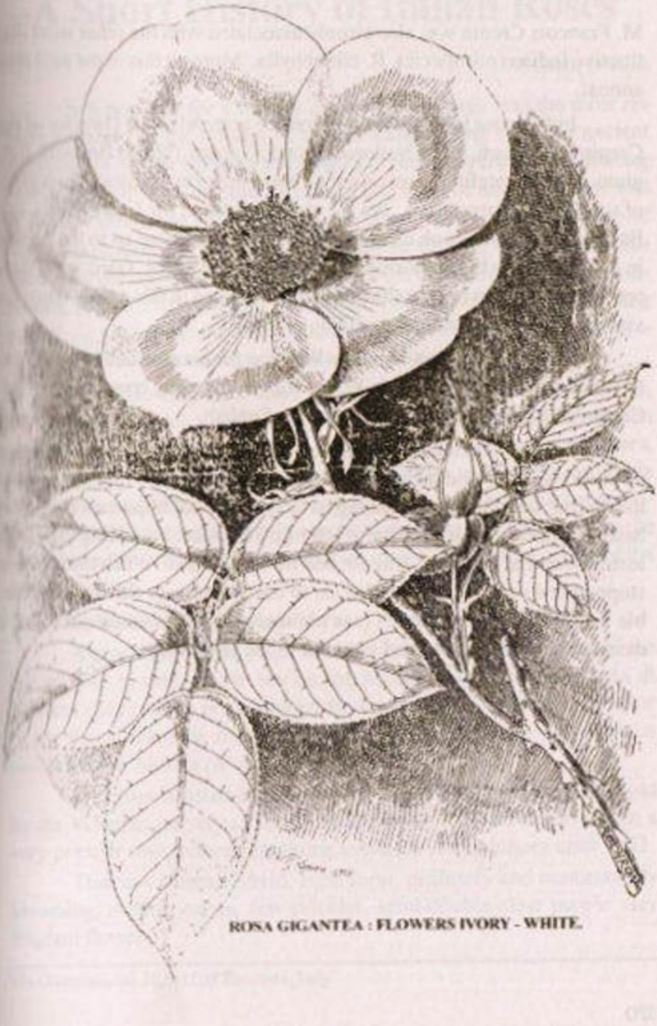
The plant was originally discovered by Dr. Watt in 1882 during the Government demarcation survey in Manipur at altitudes of 5-6000 *feet. It was later discovered by General Sir Henry Collett in the Shan Hills, Upper Burmah. It has since been collected by Dr. Henry, Mr. W. Hancock, and recently by Mr. George Forrest in North-West Yunnan, China. Mr. Forrest has discovered specimens with rose coloured flowers, which have been described as variety erubescens by Focke in Notes of the Royal Botanic Gardens, Edinburgh, v., p. 68. The variety was found in shady situations in the Lang-long, Hocking and Lichiang valleys, and is described by Mr. Forrest as 'a semi-scandent shrub of 10-20 feet, with rose-pink, fragrant flowers'. Whilst this plant closely resembles Rosa gigantea in many respects, notably in its calyx lobes and in several minor details, I am of the opinion that it is distinct. The fruit and seed, which are important characteristics in determining Roses, are wanting in the herbarium material of Focke's plant, and I have little doubt but that, when these are obtained, the plant will prove to be distinct.*

An interesting account is given in the Journal of the Linnean Society, XXviii., p.6, by General Collett, of the conditions under which he found R. gigantea. Dealing with the flora of the district where it grows, he says that it' was found on a plateau, at altitudes of 4-5000 feet, where the traveller was at once struck with the temperate character of the flora. The trees were mostly Oaks and Pines, whilst the herbaceous plants were represented by species of Ranunculus, Viola, Hypericum, Clematis, etc'. Dealing with the giant Rose, he says:- "Only two species of Rosa were seen, and both were new". The beautiful R. gigantea is particularly conspicuous, climbing over the tall forest trees, from the tops of which the long pendulous branches, covered with very large, white flowers, hang down in rich profusion. This Rose, which has larger flowers than perhaps any other wild species, is seen from a considerable distance in the jungle, reminding one more of a large Clematis than of a rose... It is only locally abundant, chiefly in dark, shady valleys. The other rose referred to was R. Collettiana, which, I believe, is not yet in cultivation. C.P. Raffill."

This completes the story of the discovery and flowering of *R.gigantea.*

In the Crepin Herbarium, in Brussels, there are several specimens of the rose to be seen, including the following:

1st sheet: 'The original Collett specimen 1888, collected in the Shan Hills between Burma and Siam.'



ROSA GIGANTEA : FLOWERS IVORY - WHITE.

2nd sheet:'Rosa khongui(?) Manipur 6000 feet. April 1882. Collected by G. Watt'

3rd sheet: Abbe Delavayi found *R. gigantea* in Yunnan, 1890 March.Pinkish white.

M. Francois Crepin was also closely associated with the other most distinctive Indian rose species, R. clinophylla. More on this in the next rose annual.

Indian rose lovers should indeed be grateful to the Director of the Crepin Herbarium, in the National Botanic Garden, (NBG) Brussels, Belgium, for the careful preservation of these important historical records, of such great interest to us. We are most grateful to Mr Ivan Louette, our Belgian friend who took us to the NBG and introduced us to the people in charge; and to the authorities at the National Botanic Garden for their ready assistance in tracing the records reproduced in this article when we visited the Herbarium in June 2003.

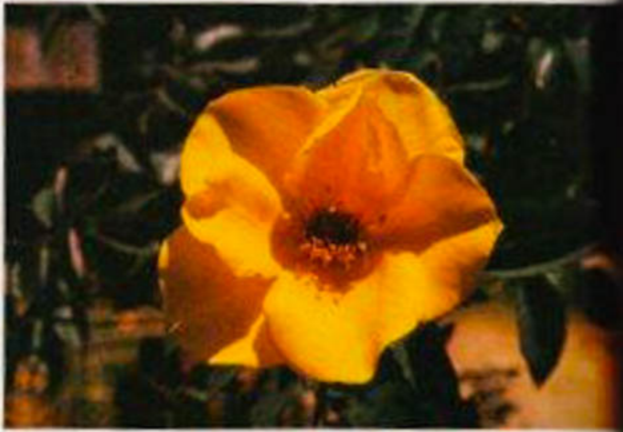
We are grateful to Mr Gene Waering for his assistance, and to Mr Brent C. Dickerson and Mr Pierre Rutten for their translation of M. Crepin's original papers from French to English.

To conclude on a personal note, Ivan Louette, who was escorting us in the N.B.G., told us, when we were in the elevator going up from the Herbarium, that he was taking us to meet a most important person. I hastily patted my hair (or what is left of it) in place, but seeing this, Ivan assured me that the V.I. P. was not one for formalities. When the elevator stopped and we got out, Ivan led us, to our surprise, to the striking marble bust of Francois Crepin!! (see photograph). A practical joke, but a most appropriate way to end our visit to the Herbarium.

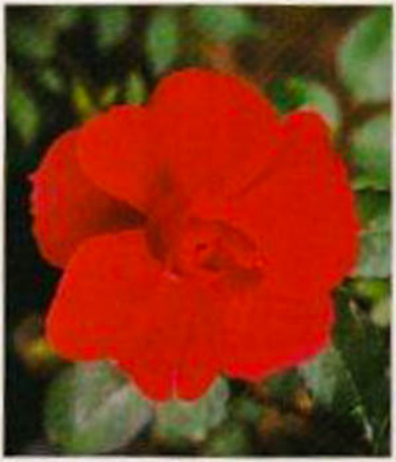
M.S. (Viru) Viraraghavan and Ivan Louette checking Crepin's Herbarium sheets on *R.gigantea* and *R.clinophylla* at NBG Brussels

Bust of M. Francois Crepin at National Botanic Garden Library & Herbarium, Brussels, Belgium.

Photos Courtesy : M.S. Viraraghavan



GOLDEN THRESHOLD
(Golden Showers X Sirohi Sunrise)



(Carefree Beauty x Bonica) X Sirohi Sunrise
Two new *R.gigantea* hybrids raised by M.S. Viraragh

Photos Courtesy : M.S. Vira

New Frontiers in Rose Growing :
the Evergreen Rose

M.S. Viraraghavan

My dream rose mocks me, "Make me real",
Doubly mocked
For only dream roses are real.

The Rose Breeder's Haiku

The warmer parts of the world-the so-called 'torrid zone' - lying between the Tropics of Cancer and Capricorn, are endowed with rich natural resources, which have traditionally attracted northern invaders. But, sadly, one invader which all of us love - the rose - has never managed to make a significant inroad into the tropics and sub-tropics.

As I will elaborate later this situation has arisen not because there are no roses suited for warm climates but that rose breeding has progressed with an entirely different objective of increasing cold hardiness.

In this background we now have one more feature which deserves the notice of all of us who cherish the dream of the rose being the world's most popular flower. And this is that economic development is rapidly taking place in the warm regions of the world, but, without roses. The consequences of this are not difficult to understand. I cite only two instances. The garden loving state of 'Singapore is singularly bereft of roses. Similarly, Thailand, again one of the 'Asian Tigers', is without roses in its warmer zones. For example, the well-known botanical garden at

Pattaya grows only one rose - a traditional pink unidentified variety, among thousands of other plants.

It is therefore of vital importance that roses suited for warm climates are hybridized, if the rose is to remain the world's most popular flower.

How has rose breeding evolved? The great ancient roses of China, the 'Chinas' and the 'Teas' and their later offspring, the 'Noisettes' are admirably suited for warmth. From the Western point of view, the original introductions from China had one very desirable characteristic - the capacity to flower repeatedly, which simply did not exist in the cold climate roses. This feature was eagerly seized upon and a very large number of new roses were raised with the aim of increasing the cold hardiness of the tender Chinese introductions, while retaining the repeat flowering habit. In this process, the warm climate genes got significantly diluted. For example, the 'Hybrid Perpetuals' have very little of the original 'China' rose genes. Ultimately the 'Hybrid Tea' arrived, and, as more and more generations were raised with one of the main objectives being cold hardiness, it became less and less suited for warm climates. In the warmer parts of India for instance, the modern Hybrid Tea is almost an annual plant and perishes after a couple of seasons.

If we are to expand the frontiers of rose growing we have therefore to take up rose breeding deliberately reversing the Western approach.

What are the ways in which better roses for warm climates can be evolved? Three possible methods appear feasible for such rose breeding:

1. Breeding based on heritage roses which are well established in warm climates, e.g. 'Archduke Charles' ('China'), 'Gruss an Teplitz' and 'Rose Edward' (Bourbons). There are many others.
2. Alternatively, modern roses, of which there are a few, which do well in warmth could be used to raise a new line. In India, older Hybrid Teas like 'Montezuma', 'Confidence' and ' Landora' are obvious choices.

3. Breeding with hitherto unutilized rose species adapted to warm climates, for example, *R. clinophylla* and R. *gigantea* with which I am working, and numerous others.

Strategy 3, though the most difficult, will clearly be ultimately the most rewarding. As the great Wilhelm Kordes of 'Crimson Glory' fame said, the soup ladle would only bring out what was in the soup tureen.

In the tropical situation, selection for beautiful flowers is just not enough. This is for the simple reason that tropical flowering plants are endowed with beautiful evergreen foliage, and the rose, if it is to remain an aristocrat of the garden, has to have singularly beautiful evergreen foliage - such foliage as will enable it to be a beautiful plant even when not in bloom.

This may appear to be an impossible objective but we have one very fortunate advantage, namely, that there are a large number of evergreen rose species which have beautiful foliage, together with the most valuable characteristic of being natives of the warmer parts of the world.

These are the roses which should be utilized in warm climate rose breeding. With this as the basis of my philosophy of rose breeding I have worked extensively with *R. clinophylla* and R. *gigantea.*

Taking up *R. clinophylla,* which is perhaps the world's only tropical rose, we have indeed an unique adaptation to warmth and swampy conditions. This species, which is endowed with lovely evergreen foliage and interestingly scented flowers, exists in 3 forms. The 'Bengal' form adapted to hot moist climates, the 'Bihar' form adapted to hot dry climates, and the 'Mount Abu' form, adapted to desert conditions. A rich genetic endowment indeed! I expect great things from this rose of the eroded marshlands. To quote Kobayashi Issa's haiku

'Even wild roses on an-infertile land reach enlightenment.'

I prefer to interpret this to mean that such a rose reaches enlightenment to the rose breeder!

The second species on which my work is based is *R. gigantea,* Indian form, which is the world's largest wild rose, reaching up to 25 meters while climbing through trees, which is its natural habitat and with single yellow to white flowers which can reach 15 cms. Jack Harkness described this rose as having six great virtues - health, beauty, vigor, scent, good foliage and remontancy. One other very interesting trait is that *R. gigantea* flowers in peak winter and hybrids with this characteristic would be loved by cut-flower growers in the warm parts of the world who would like to target maximum production for Christmas, New Year and St. Valentine's Day.

My work with R., *gigantea* has progressed faster than with *R. clinophyila* as this species, though somewhat remotely, is in the genetic background of the modern rose.

I come now to the final part of my presentation, namely, what is it we should look for in warm climate rose breeding. Apart from evergreen foliage, we have to put special emphasis on a more rounded plant habit and shrub-like growth, so that the tropical rose fits into the modern garden landscape. The days of exclusive rose gardens are over. Fragrance and disease resistance are of vital importance, but we should not neglect what sets the rose apart from all other flowers - the beautiful Hybrid Tea form, the legacy of *R. gigantea* and not the result of just human intervention.

To my mind this ideal rose will come in all shapes and sizes, and since the emphasis is on roses with beautiful foliage, we have to put a special priority on bringing in the genes of wild roses which are exceptionally well endowed. I am thinking of R. *laevigata,* which while being well adapted to warmth has perhaps the most beautiful of all rose foliage. Fortunately, there is sufficient genetic variation in this species and its hybrids – the original species, other forms of the species – *R. cooperii* and *R. laevigata rosea,* as well as hybrids like 'Anemone' and 'Ramona', which unlike the species have pink to red flowers. These are all diploids. But there is a very interesting tetraploid raised by Dr. Basye of Texas - the colchicine induced tetraploid from a cross of *R. banksia* and *R. laevigata.* Other rose breeders may of course, select a different evergreen rose species to reach the objective.

But in this welter of genetic diversity we can surely find roses of the future - roses which will expand the frontiers of rose growing.

Ultimately each rose breeder will have to find his way -

'If you do not get it from yourself,
Where will you go for it?'

(The Zenrin)

Editors' Note : This is the text of the talk given at the World Rose Convention, Osaka, Japan, in May 2006.

Copies of the original

Indian Rose Annual 2007

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"Hill View" Fern Hill Road, Kodaikanal - 642 101.

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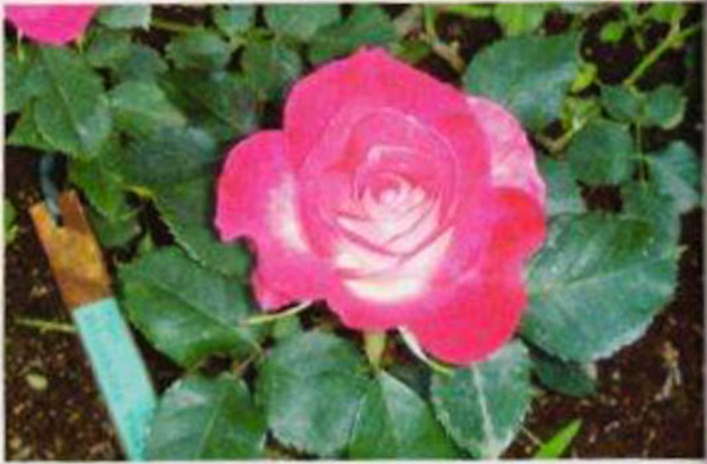
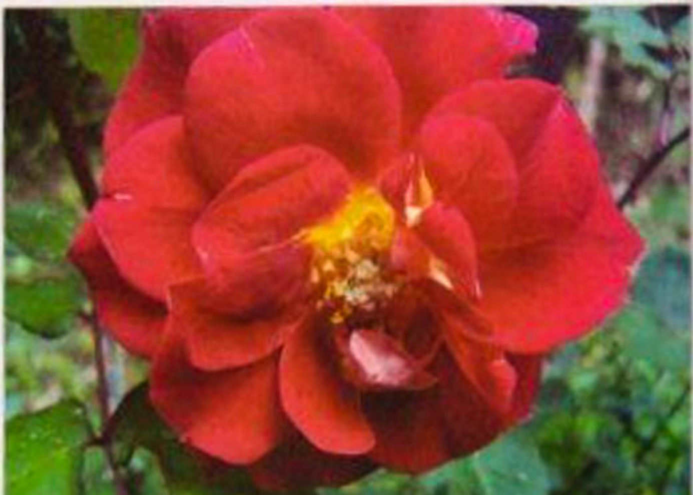


"Blushing Yuki"
(Silver Jubilee x Priyatama)



"EMINA"
(Unknown Bicolor H.T. x Sirohi Sunrise)

Courtesy : M. S. Viraraghavan

Indian Rose Annual - IRA 2008

Wild Roses in India and the Himalayas

M.S.Viraraghavan

All of us are aware of the world's biggest mountain chain, the Himalayas, which stretches for 2,250 km, from west to east in the extreme north of India, as also part of neighouring countries like Pakistan, Nepal, and Bhutan. The Himalayas are where most of India's wild roses are located. The distribution of these roses is significantly linked to the extreme variation in the Himalayan climate, from alpine desert in the extreme west, to Cherrapunji in the Khasi Hills in the eastern end, which has the world's heaviest rainfall.

The non-Himalayan rose species include *R. gigantea* found most prominently in Manipur, *R. longicuspis* found in the Khasi hills, as well as in certain parts of the eastern Himalayas, *R. clinophylla* in the Rajmahal Hills and the Chota Nagpur Plateau in Bihar State but also in many other places in the country. *R. leschenaultiana* is the only other non-Himalayan species, found in the Nilgiri and Palni ranges of south India which are part of the Western Ghats, a mountain range running north to south on the west coast of peninsular India for a length of over 1,000 km.

We will now consider the various rose species to be found in the Himalayas and in the rest of India.

The treatment is from the horticulturist's point of view and taxonomic details are kept to the minimum.

R. webbiana

R. webbiana is the typical inhabitant of the semi arid Western Himalayas. It is a shrub, reaching up to 2.5 metres with slender branches and straight prickles, leaves with small rounded leaflets and prickly leaf stalks. The flowers are borne in clusters of 1 to 3. It is a rose of unique, even fragile beauty with lilac pink to dark pink flowers, contrasting admirably with the rugged rocky terrain of the region.

To quote Jack Harkness, it "might be called the Fairy Queen of the wild roses for its sweetness and grace. The plant grows about head high, and trails its older shoots down to the ground, all neatly in the shape of a graceful lady in lacy crinolines. Lace is the right word too for an impression of the tiny leaves and dark twigs. The little flowers are all delicacy in their pink petals and discreetly attractive perfume. Finally, the hips adorn the bush in the autumn, in the shape of ewers held upside down. They are not large, for nothing about *R. webbiana* is aggressive; their size is sufficient to attract notice and hold admiration".

The book, "The Family Rosaecea in India" by Ghora and Panigrahi refers to 2 additional varieties of *R. webbiana,* namely *R. webbiana var. glandulosa,* a variant with red flowers found on the edges of the alpine zone in Kashmir, and *R. webbiana var. latifolia.*

Field studies are required to confirm the existence of these varieties at the present time.

R. macrophylla

R. macrophylla is one of the largest flowered and most strikingly coloured of the Himalayan rose species, with flowers ranging from dark pink to almost red. It forms an upright shrub reaching up to 5 metres with dark red or purple stems.

We had a dramatic introduction to this magnificent rose, in 1982, when climbing the footpath to the Valley of Flowers, an alpine valley in the Central Himalayas at around 2,700 metres elevation. Walking across a bend in the path, we were about to cross the ice cold waters of the River Pushpganga, when we saw the reflection, in the waters, of the beautiful red flowers - a stunning sight indeed. It was a huge bush, covered with blooms.

The famous botanist, J.D. Hooker, called it 'the great red rose, one of the most beautiful Himalayan plants, whose single flowers are as large as the palm of the hand'.

Ghora and Panigrahi refer to 3 additional varieties of *R. macrophylla* in India. Apart from *R. macrophylla* itself, where the petals are pink to red, *R. macrophylla* var. *hookeriana* with pink to white petals, var. *minor* and var. *arguta* are mentioned.

Here again contemporary field studies are required.

R. brunonii

R. brunonii is the typical musk rose of the Himalayas, forming enormous climbing bushes at fairly low altitudes - around 1,200 - 2,400 metres, with hooked prickles and terminal clusters of many fragrant white to cream flowers. These are borne in tremendous bunches with that enchanting capacity of the musk rose, noted by die great rosarian, Graham Thomas, of wafting its fragrance in the air.

The foliage is also very handsome in some forms, especially the well known *Brunonii* 'La Mortola' where the leaves are a striking grey green.

We saw many bushes of *R. brunonii* on our 1982 trip, on the same footpath to the Valley of Flowers, at 1,800 metres.

R. sericea

This is the typical rose of the higher reaches of the Himalayas, quite widespread in distribution. It is a stiff erect shrub with leaves with small leaflets and solitary white to cream flowers. The plants can reach heights in excess of 4 metres.

On the same route to the Valley of Flowers we could see bushes in large numbers, but only above 3,000 metres.

It has the unique distinction of being four-petalled.

The large sized prickles - red and partly translucent, are a very attractive feature of the form, *R. sericeapteracantha.*

R. longicuspis

This is the typical musk rose of the eastern Himalayas. We found it on the sides of a ravine on Shillong Peak in the Khasi Hills, around 2300 metres altitude. It is an extensive climber reaching well over 10 metres, with clusters of white flowers with a trace of pink and the most beautiful foliage - elongated and a shining dark green.

R. gigantea

This is perhaps the largest of all wild roses with the most extensive growth, up to 20 metres, the giant stems thicker than a man's arm, very large flowers up to 15 cm across, and big round hips 2 ½ cm across. The numerous prickles are also of giant size.

The five petalled flowers are quite a deep yellow when opening, fading thereafter to ivory and cream. The yellow pigments seem dominant in the plant, as even the hips ripen to yellow rather than the more usual orange red. And these hips are eaten by the locals. They are sold along with other vegetables and fruits in the bazaars in north-east India.

We found this plant at around 2,200 metres on the footpath to Mount Sirohi, east of Ukhrul town in Manipur State, climbing into trees, which is their normal pattern of growth.

Sir George Watt, Surveyor General of British India, who first discovered this rose in 1882, remarked that the flowers of the rose climbing through forest trees looked like golden magnolias, when seen from a distance. I like to think that the specimen we found was the same as did Sir George Watt!!

Though Sir George Watt was the first to discover this species in Manipur, the name *R. gigantea* was first published by Sir Henry Collett, through François Crépin. Collett found the plant in the Shan Hills in Upper Burma, now Myanmar.

There has been some speculation whether there is any genetic difference between these 2 finds, arising out of the fact that the buds and flowers *of R. gigantea* Collett are white, whereas the plants from Manipur, to which the discoverer, George Watt, gave the name *R. macrocarpa,* have flowers which tend more towards a creamy yellow, especially in the bud stage.

The location where the rose was found in Manipur, is about 5 degrees further North and altitude around 500 metres higher than the Burma specimen, which again may or may not be significant.

Interestingly, seedlings, raised from seed collected in Manipur in the wild, show considerable variation in flower color especially in the bud stage. Some of the plants bear buds of quite a dark shade of yellow, whereas others are white. But these variations disappear at the fully open stage, where the flowers are cream.

This, perhaps, indicates that speculation on whether the Manipur and Burma forms are genetically different are premature, in the absence of DNA studies.

Crépin himself considered the two to be the same rose. But we can hope that the Manipur type is at least marginally cold hardier.

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The third form, also called *R. lyelli,* is found in the lower Himalayas around Kumaon, in Nepal, and in Mount Abu, a hill station at about 1200 metres in Rajasthan, in western India.

We were able, after much search, to locate this plant growing in Oriya Village, in Mount Abu, at virtually the same point where it was originally located by G. King in 1888. It differs from the eastern Indian forms in bearing flowers in corymbs, rather than singly.

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The shining evergreen foliage as well as the involucres which surround the buds are a feature of *R. clinophylla.* This specie is closely related to *R. bracteata.*

R. leschenaultiana

This rose species, one of the southernmost representatives of the musk rose clan (the alternate name is *R. moschata leschenaultiana)* is endemic to the Nilgiris and Palni Hills, which are part of the Western Ghats range. It is an extensive armed straggler reaching up to 10 metres, forming impenetrable thickets in the native forests. The flowers are quite large by musk rose standards and are very showy, 7 ½ cm wide.

A distinctive feature are the purple stems.

This species is named in honor of the French botanist, Leschenault de la Tour, who visited India in the 1810's, collected many plants and sent them to the island of Reunion and France.

R. ecae

So far I have dealt with roses which are typically to be found in India but there are several others, where the Himalayas and India may not be the centre of distribution but where the provenance extends into our country.

One such rose is *R. ecae,* the typical golden rose of Afghanistan, which extends into Kashmir and Ladakh.

This is a wiry bush with flowers of a most attractive shade of bright yellow.

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Kashmir and the higher reaches of Himachal Pradesh are also home to the golden rose of Persia, now Iran, *R. foetida.* The double flowered mutant of this rose, *R. foetida persiana* is, as you know, in the background of the golden and bicolour roses of today, through the pioneerining work of the great French hybridist, Pernet Ducher.

Apparently *R. foetida persiana* may be a natural mutant, as Mr. Luciano Arcangeli reported sighting several plants in completely uninhabited parts of the extreme northern Himalayas, where a possible natural mutant with cerise red to crimson red flowers is also found.

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R. banksiae

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It is an extensive climbing shrub capable of reaching roof tops. The branches are unarmed.

There are two forms which are common, *R. banksiae var. banksiae,* with double white flowers and violet scent, and *R. banksiae forma lutea,* with clear yellow double flowers.

R. moschata (R. glandulifera)

A fairly common cultivated rose in India, perhaps introduced by the Mughals, is the true *R. moschata,* as distinct from *R. brunonii,* the musk rose of the Himalayas. This was known as *R. glandulifera* in the past.

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The everblooming form of *R. chinensis, R. chinensis semperflorens* (Slater's Crimson China) is commonly cultivated in Indian gardens. Some authorities consider that this rose has been cultivated in India for several centuries. Giant bushes could be found almost growing wild in the past.

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In addition to the species mentioned above, Ghora and Panigrahi list the following as also to be found in the Himalayan region;

1. *R. rubiginosa (eglanteria)*
2. *R. nanothamnus*
3. *R. beggeriana*
4. *R. hemispherica*
5. *R. platyacantha*
6. *R. souleana*
7. *R. bracteata*

But as I mentioned earlier while these roses occur, the Himalayas cannot be considered to be the centre of their distribution and so I will not deal with them.

In conclusion it should be stressed that field work on the present status of rose species in the Himalayas is conspicuously lacking. There is every need to undertake these studies before the progress of civilization wipes out genetic diversity. Those who have the good fortune to look at our wild roses in the great mountains of the country will easily realize why I had called them the 'Aristocrats of the Rose World' in a previous article.

Editors' Note:

This is the text of the talk given at the World Heritage Rose Conference, in Chaalis, near Paris, France in June 2007.

☆☆☆

Alas that Spring should vanish with the Rose!
That Youth's sweet-scented Manuscript should close!
The Nightingale that in the bushes sang,
Ah, whence, and whither flown again, who knows!

Omar Khayyam

Copies of the original

Indian Rose Annual 2008

Wild Roses in India and the Himalayas

M.S.Viraraghavan

All of us are aware of the world's biggest mountain chain, the Himalayas, which stretches for 2250 kms., from west to east in the extreme north of India, as also part of neighouring countries like Pakistan, Nepal, and Bhutan. The Himalayas are where most of India's wild roses are located. The distribution of these roses is significantly linked to the extreme variation in the Himalayan climate, from alpine desert in the extreme west, to Cherrapunji in the Khasi Hills in the eastern end, which has the world's heaviest rainfall.

The non-Himalayan rose species include *R.gigantea* found most prominently in Manipur, *R. longicuspis* found in the Khasi hills, as well as in certain parts of the eastern Himalayas, *R.clinophylla* in the Rajmahal Hills and the Chota Nagpur Plateau in Bihar State but also in many other places in the country. *R. leschenaultiana* is the only other non-Himalayan species, found in the Nilgiri and Palni ranges of south India which are part of the Western Ghats, a mountain range running north to south on the west coast of peninsular India for a length of over 1000 kms.

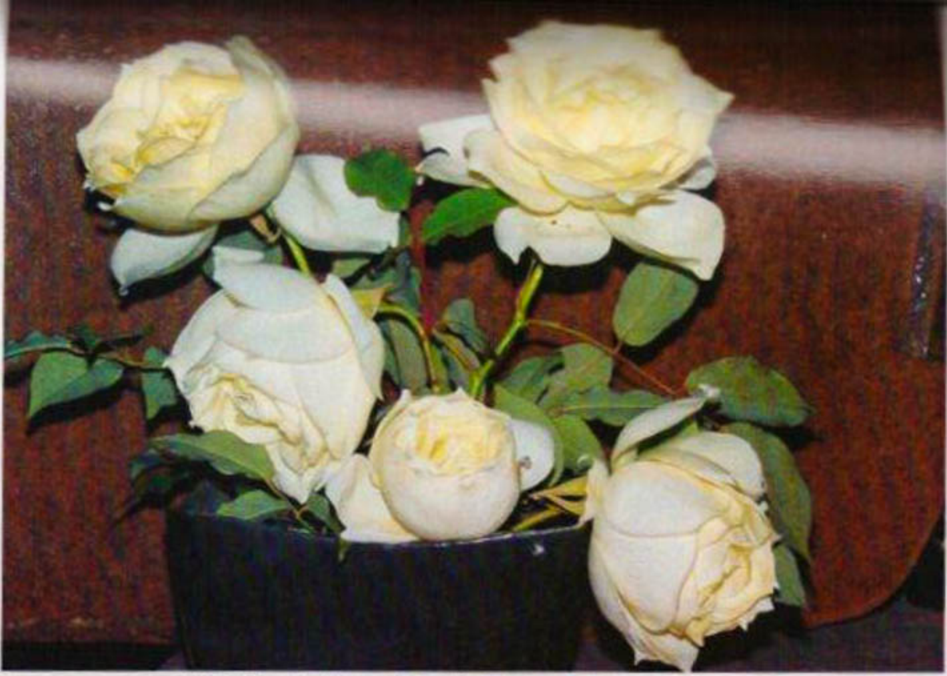
We will now consider the various rose species to be found in the Himalayas and in the rest of India.

The treatment is from the horticulturist's point of view and taxonomic details are kept to the minimum.

R.Webbiana

R. webbiana is the typical inhabitant of the semi arid Western Himalayas. It is a shrub, reaching up to 2.5 metres with slender branches and straight prickles, leaves with small rounded leaflets and prickly leaf stalks. The flowers are borne in clusters of 1 to 3. It is a rose of unique, even fragile beauty with lilac pink to dark pink flowers, contrasting admirably with the rugged rocky terrain of the region.

"Hillview", Fernhill Road, Kodaikanal - 624 101, Tamil Nadu



TANGKUL TREASURE (Reve d'Or x *R.gigantea*)

LARGE CLIMBER

Named in honour of the Naga tribe in the area where *R.gigantea* is found in North East India

To quote Jack Harkness, it "might be called the Fairy Queen of the wild roses for its sweetness and grace. The plant grows about head high, and trails its older shoots down to the ground, all neatly in the shape of a graceful lady in lacy crinolines. Lace is the right word too for an impression of the tiny leaves and dark twigs. The little flowers are all delicacy in their pink petals and discreetly attractive perfume. Finally, the hips adorn the bush in the autumn, in the shape of ewers held upside down. They are not large, for nothing about *R.webbiana* is aggressive; their size is sufficient to attract notice and hold admiration".

The book, "The Family Rosaecea in India" by Ghora and Panigrahi refers to 2 additional varieties of *R.webbiana*, namely *R.webbiana var. glandulosa*, a variant with red flowers found on the edges of the alpine zone in Kashmir, and *R. webbiana latifolia*.

Field studies are required to confirm the existence of these varieties at the present time.

R. macrophylla

R. macrophylla is one of the largest flowered and most strikingly coloured of the Himalayan rose species, with flowers ranging from dark pink to almost red. It forms an upright shrub reaching up to 5 metres with dark red or purple stems.

We had a dramatic introduction to this magnificent rose, in 1982, when climbing the footpath to the Valley of Flowers, an alpine valley in the Central Himalayas at around 2700 metres elevation. Walking across a bend in the path, we were about to cross the ice cold waters of the River Pushpganga, when we saw the reflection, in the waters, of the beautiful red flowers - a stunning sight indeed. It was a huge bush, covered with blooms.

The famous botanist, J.D.Hooker, called it 'the great red rose, one of the most beautiful Himalayan plants, whose single flowers are as large as the palm of the hand'.

Ghora and Panigrahi refer to 3 additional varieties of *R. macrophylla* in India. Apart from *R. macrophylla* itself, where the petals are pink to red, *R. macrophylla* var. *hookeriana* with pink to white petals, var.*minor* and var. *arguta* are mentioned.

Here again contemporary field studies are required.

R.brunonii

R. brunonii is the typical musk rose of the Himalayas, forming enormous climbing bushes at fairly low altitudes – around 1200-2400 metres, with hooked prickles and terminal clusters of many fragrant white to cream flowers. These are borne in tremendous bunches with that enchanting capacity of the musk rose, noted by the great rosarian, Graham Thomas, of wafting its fragrance in the air.

The foliage is also very handsome in some forms, especially the well known *Brunonii* 'La Mortola' where the leaves are a striking grey green.

We saw many bushes of *R. brunonii* on our 1982 trip, on the same footpath to the Valley of Flowers, at 1800 metres.

R.sericea

This is the typical rose of the higher reaches of the Himalayas, quite widespread in distribution. It is a stiff erect shrub with leaves with small leaflets and solitary white to cream flowers. The plants can reach heights in excess of 4 metres.

On the same route to the Valley of Flowers we could see bushes in large numbers, but only above 3000 metres.

It has the unique distinction of being four-petalled.

The large sized prickles – red and partly translucent, are a very attractive feature of the form, *R.sericea pteracantha*.

R.longicuspis

This is the typical musk rose of the eastern Himalayas. We found it on the sides of a ravine on Shillong Peak in the Khasi Hills, around 2300 metres altitude. It is an extensive climber reaching well over 10 metres, with clusters of white flowers with a trace of pink and the most beautiful foliage – elongated and a shining dark green.

R.gigantea

This is perhaps the largest of all wild roses with the most extensive growth, up to 20 metres, the giant stems thicker than a man's arm, very large flowers up to 15 cms. across, and big round hips 2 ½ cms. across. The numerous prickles are also of giant size.

The five petalled flowers are quite a deep yellow when opening, fading thereafter to ivory and cream. The yellow pigments seem dominant in the plant, as even the hips ripen to yellow rather than the more usual orange red. And these hips are eaten by the locals. They are sold along with other vegetables and fruits in the bazaars in north-east India.

We found this plant at around 2200 metres on the footpath to Mount Sirohi, east of Ukhrul town in Manipur State, climbing into trees, which is their normal pattern of growth.

Sir George Watt, Surveyor General of British India, who first discovered this rose in 1882, remarked that the flowers of the rose climbing through forest trees looked like golden magnolias, when seen from a distance. I like to think that the specimen we found was the same as did Sir George Watt!!

Though Sir George Watt was the first to discover this species in Manipur, the name *'R.gigantea'* was first published by Sir Henry Collett, through Francois Crepin. Collett found the plant in the Shan Hills in Upper Burma, now Myanmar.

There has been some speculation whether there is any genetic difference between these 2 finds, arising out of the fact that the buds and flowers of *R.gigantea* Collett are white, whereas the plants from Manipur, to which the discoverer, George Watt , gave the name *R.macrocarpa*, have flowers which tend more towards a creamy yellow, especially in the bud stage.

The location where the rose was found in Manipur, is about 5 degrees further North and altitude around 500 metres higher than the Burma specimen, which again may or may not be significant.

Interestingly, seedlings, raised from seed collected in Manipur in the wild, show considerable variation in flower color especially in the bud stage. Some of the plants bear buds of quite a dark shade of yellow, whereas others are white. But these variations disappear at the fully open stage, where the flowers are cream.

This, perhaps, indicates that speculation on whether the Manipur and Burma forms are genetically different are premature, in the absence of DNA studies.

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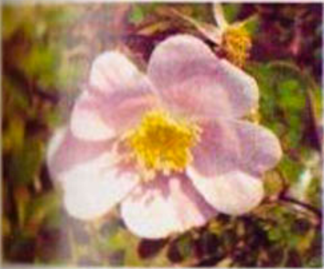
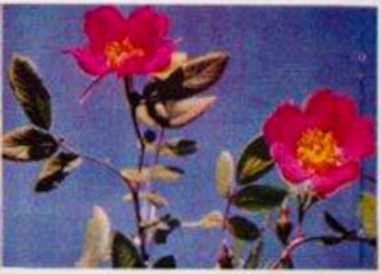

R. webbiana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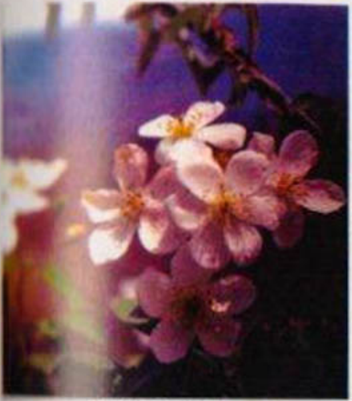
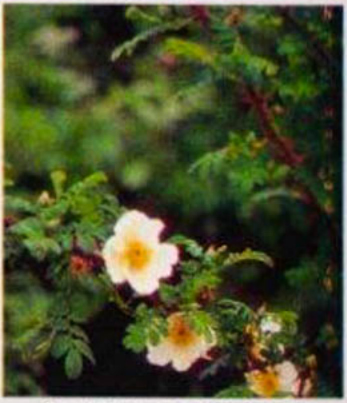
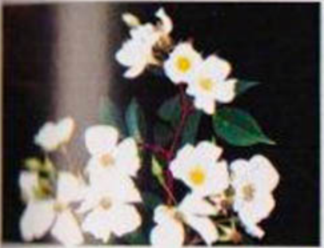

R. brunonii


R. sericea pteracantha


R. longicuspis

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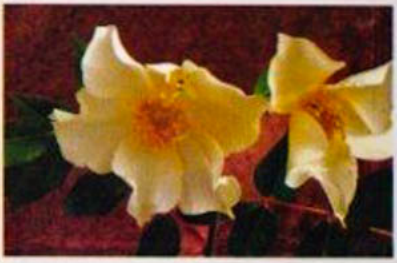

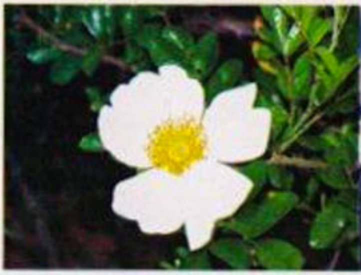

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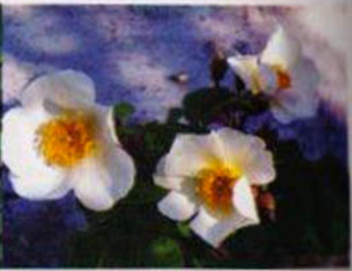
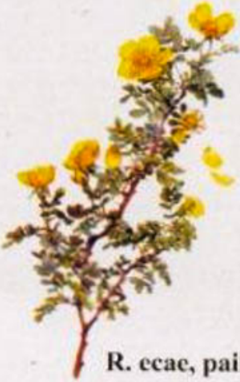
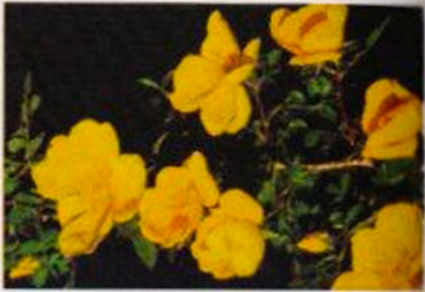


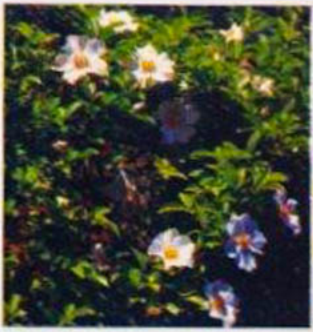
R. leschenaultiana



R. ecae, painting



R. foetida



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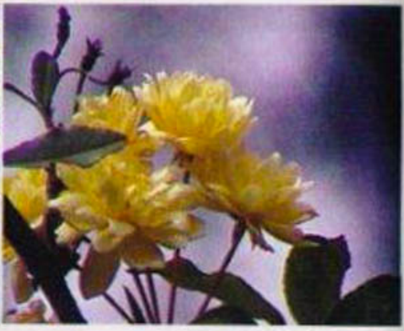

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2. *R.nanothamnus*
3. *R.beggeriana*
4. *R.hemispherica*
5. *R.platyacantha*

6. *R.souleana*
7. *R.bracteata*

But as I mentioned earlier while these roses occur, the Himalayas cannot be considered to be the centre of their distribution and so I will not deal with them.

In conclusion it should be stressed that field work on the present status of rose species in the Himalayas is conspicuously lacking. There is every need to undertake these studies before the progress of civilization wipes out genetic diversity. Those who have the good fortune to look at our wild roses in the great mountains of the country will easily realize why I had called them the 'Aristocrats of the Rose World' in a previous article.

Editors' Note :

This is the text of the talk given at the World Heritage Rose Conference, in Chaalis, near Paris, France in June 2007.

* * *

Alas that Spring should vanish with the Rose!
That Youth's sweet-scented Manuscript should close!
The Nightingale that in the bushes sang,
Ah, whence, and whither flown again, who knows!

Omar Khayyam

Indian Rose Annual - IRA 2009

Sustainable Rose Growing & The Breeding of New Roses
The View From India

Viru Viraraghavan

Sustainable rose growing is a subject which deserves to be center stage in the warm Indian climate, and indeed, in all other warm climates of the world, where disease problems are at their worst. What do we mean by “sustainable rose growing"? “Sustainable" in the broad sense means “something which can be maintained” and for the environmentally conscious, as all of us rose growers should be, it means ‘maintenance without adverse environmental impact’. Unfortunately, standard rose growing practices in India are quite often the very reverse of sustainable, burdened as the Indian rose grower is with growing roses, raised in temperate climates, under ropical conditions. Ask a keen rose grower in India whether you can grow roses, and the reponse will be an enthusiastic “yes", but further enquiry will reveal the amount of exertion involved - weekly combination sprays with fungicides and insecticides is the easiest part. The environmental impact of such practices is significant, and it is no surprise, considering the amount of hard work involved that rose growing is confined to the real enthusiast or keen exhibitor,

The pionnering rose hybridizer, B.S. Bhatcharji put the matter in simple words: - he was writing in the 1930's - that rose growing is for the pleasure of raising beautiful flowers under normal care. As a hands-on horticulterist what be meant by ‘normal care’ was that there was no need to display the over-enthusiasm of the rose exhibitor, but at the same time you could not expect to grow a rose without giving it the care which you would bestow on raising tomatoes or cauliflowers in your vegetable patch.

If we are to have easily grown roses - such rose varieties as can be grown under normal care, the basic requirement is growing roses which have reasonable resistance to fungus problems. Here again a note of caution is very much required. Rose breeders should not fall into the trap of striving for roses with that mirage ‘immunity’, but look to develop such plants which have the capacity to recover from infection without the use of fungicides. Rose varieties touted as immune to fungus problems have an alarming habit of suddenly becoming vulnerable as the fungus evolves faster than the rose’s capacity to defend itself. A case in point is ‘Baby Love’, which was completely resistant to Black Spot in my tropical mountain climate - with almost constant moist cool weather - no summer, no winter. A laboratory for breeding Black Spot!! Sure enough, after the fourth year, ‘Baby Love’ succumbed completely to Black Spot, and now performs much worse than less acclaimed varieties.

The capacity to recover from infection is a feature of many of the heritage roses, which is why they have lasted so long. Many heritage rose varieties, even under adverse conditions, as in the tropical parts of India, can be grown without fungicide protection. A case in point is how the favorite garland rose, 'Rose Edward', which is grown over several thousands of acres in India, will contract both Mildew and Black Spot but come back victorious, and flower in delightful profusion every time.

We now come to another basic question. Is disease resistance linked to adaptation to specific climates? Can there be an universal great rose, or do we have to satisfy ourselves with roses adapted to climatic regions? Sadly, regional adaptation seems to be the rule. Even the great rose ‘Peace’ is quite unhappy in the Indo-Gangetic plain of northern India, where otherwise spectacular roses can be, and are, grown. But some of the shrub roses have wider adaptation, e.g., 'Prosperity', 'Carefree Beauty', 'Belinda’s Dream'.

The performance of the tropical *R. clinophylla* and the sub-tropical *R. gigantea*, the two species with which I am working, illustrates the point. *R. clinophylla* was planted in the sandy and saline soil of Madras (now called Chennai) on the south-eastern coast of India, in a garden quite near the sea, where the water had also become quite salty, owing to excessive pumping. Amazingly, the rose was quite happy despite very little attention, no sprays, no manures, and only the occasional watering by a rather erratic gardener. The Madras climate, warm and humid almost throughout the year, is one of the worst rose growing climates in India, but this rose has fresh green foliage and makes a nice bush.

When *R. clinophylia* was grown in the hot dry climate of Hosur, near Bangalore, in peninsular India, it again adapted itself remarkably well. One plant is 15 feet high and 10 feet across, in spite of the competition from the greedy roots of the nearby hedge. But *R. clinophylla* in the cool moist mountain climate of my Kodaikanal home in southern India, under my personal care, is clearly not very happy. Mind you, this is a climate in which the average rose thrives.

On the other hand *R. gigantea* is a spectacular success in Kodaikanal. Some of my plants have climbed about 40 feet into the cypress trees, flower profusely. and never, but never, get Mildew or Black Spot. Naturally, no spraying is feasible on a 40 foot high plant.

If the rose is a plant essentially adapted to climatic regions, we have to clearly hybridize roses for each region to get the optimum results. For the warm climate rose grower there is no doubt that a separate line of breeding, separate from the breeding lines in temperate regions, is clearly essential,

What should be the basis for such focused breeding? Obviously, we have to start with heritage roses well adapted to such climates. Of these, the Chinas like 'Louis Philippe’, 'Craimoisi Superier’, ‘Archduke Charles’, and ‘Old Blush’. Tea roses like 'Duchess de Brabant’, 'Mrs. B.R. Cant’, 'Rosette Delizy’, ‘Madame Falcot’ and 'Mrs. Dudley Cross' and some of the Bourbons - 'Rose Edward', ‘Maggie’ ('Eugene E. Marlitt'?), ‘Souvenier de la Malmaison’, stand out in various warm climates ranging from peninsular India, southern United States, Puerto Rico, the West Indies, Bermuda and Brazil, and parts of Australia. Many of the Noiseties and a few of the Hybrid Perpetuals, for example, 'Frau Karl Druschki' and 'Paul Neyron’, are similarly well adapted, as also some miscellancous shrub roses like ‘Prosperity’ etc. mentioned earlier.

Among the relatively modern roses, the extra vigorous ones - ‘Queen

Elizabeth' and 'Montezuma', for example, are able to cope better with the warmth (but the average Hybrid Tea or Floribunda is very short-lived indeed).

Such roses, as well as *R. clinophylla* and *R. gigantea* form the basis for the new breeding line which is being developed. At this comparatively early stage of breeding it is well to remember that the rose in a tropical situation has to compete with many other beautifully luscious tropical plants, which are endowed with lovely evergreen foliage. It therefore becomes imperative to create roses which have equally beautiful evergreen foliage - such roses as are beautiful even when not in bloom, if the gardener in a warm climate is ever to grow roses. As it is, very few roses are being grown in these climates.

In addition to the foliage factor und disease resistance, the forcing conditions provided by tropical heat have to be taken into account. We need roses in the Tea-clinophylla line which are bushy and evergreen, and Gigantea hybrids of manageable size. Some of the new roses raised with this approach are already proving to be good performers in warm climates. We could mention Tea roses like 'Faith Whittlesey' and 'Garnet Crest', the hybrid Clinophyllas, 'Silver Dawn' and 'Ganges Mist', the Gigantea Tea, 'Alister's Gift', and the hybrid Giganteas like 'Naga Belle', 'Evergreen Gene', 'Amber Cloud' and 'Golden Threshold' (the latter three being climbers), as being well adapted. I confess that 'Amber Cloud' and 'Golden Threshold' could hardly be described as growing to a manageable size, but other good qualities justify inclusion. They are glorious in large gardens.

Further developments in the line include bringing in the foliage of *R. laevigata*, so well adapted to warmth and endowed with perhaps the most beautiful of rose foliage. The use of *R. roxburghii* also suggests itself, as such hybrids could well grow to the dimensions of small trees, and be the substitute for flowering cherries in the tropics.

The warm climates of the world, including many rapidly developing countries have so far been denied new roses which can be grown sustainably. And we rose breeders have to strive hard to change this situation so glaringly contradicting the claim that the rose is the world's favorite flower.

Copies of the original

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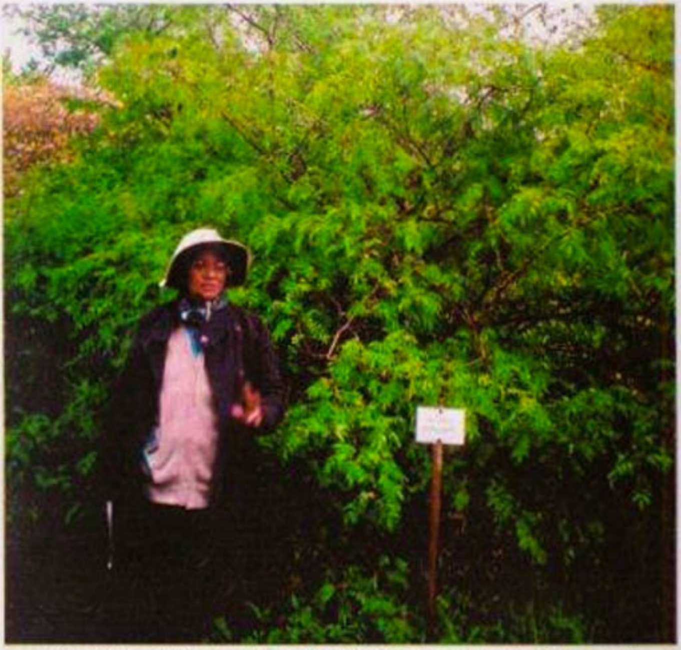
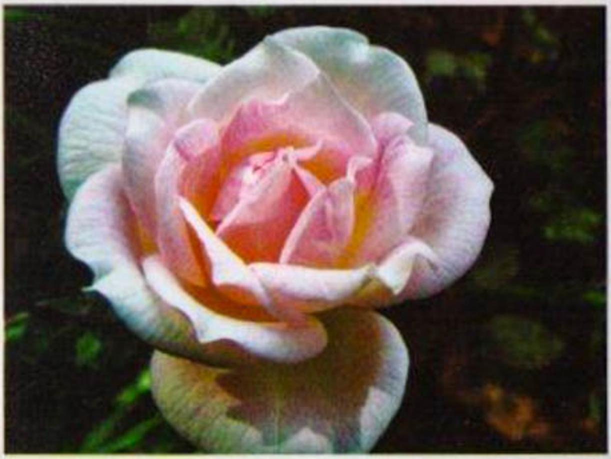
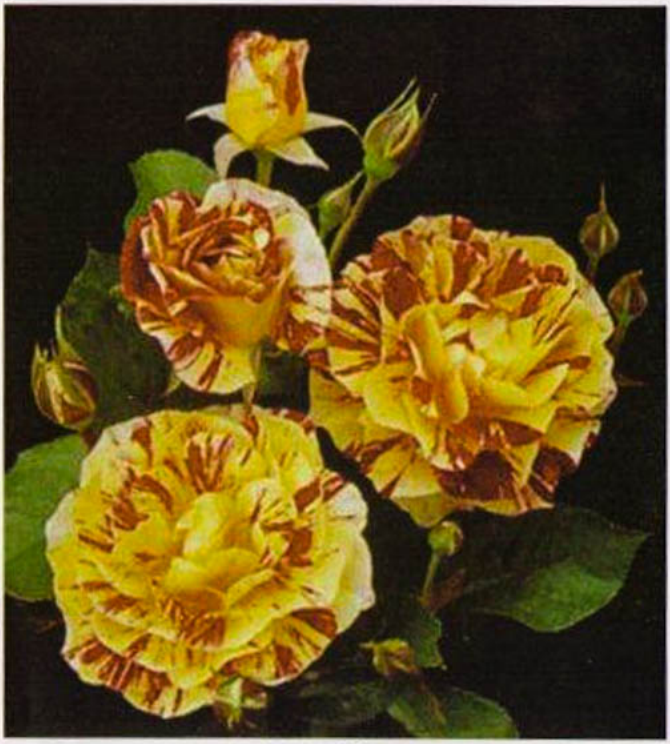


R. roxburghii growing like a tree in Caerhays, Cornwall
(Girija Viraraghavan in front)

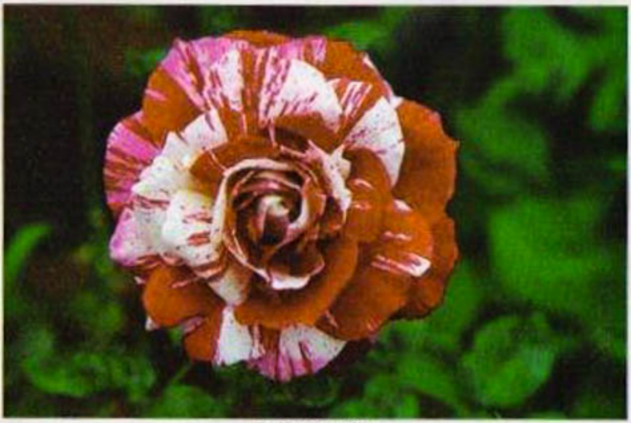


Faith Whittlesey - A new Tea rose which
does well in warm climates

Photo courtesy : M.S. Viraraghavan



George Burns



Julio Igesias

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Indian Rose Annual - IRA 2009

The Making of a Heritage Rose Garden in the Centenary Park, Ooty

Girija Viraraghavan

The Centenary Rose Park in Ooty has become justly famous for the marvelous display of roses all the year round. The numbers of Visitors who throng the paths along the roses beds on the five terraces, oooh-ing and aaah-ing at the perfect beauties in all shades of colour, would gladden the hearts of all rose lovers. Hopefully, after a visit to this garden, wich is a must for any tourist to this hill station, many will be persuaded to grow roses in their own homes, in gardens, terraces or just balconies.

Though the number of rose plants is staggering - 30,000 roses of about 3,000 varieties, in the five hectare garden, all are only modern roses - Hybrid Teas, Floribundas and miniatures. No doubt they are all beautiful and deserve a place in a rose garden. But equally, the beauties of by-gone years, called 'heritage roses' or OGRs (old garden roses), many of which are the progenitors of today's roses, need to be grown and appreciated. Species roses, the wild ancestors of all roses, are charming in their simple, single flowered elegance, need to be grown, too.

In order to understand the evolution of the modem rose hybrid, we need to know the background, the history of the various kinds, the classifications of the different types, one leading sequentially to the next. A garden which showcases such a history would be comprehensive and well rounded, and would be of great interest to the more knowledgeable visitor to the garden.

When we mooted the idea of entering the Centenary Park for the WFRS Garden of Excellence Award, we requested our good friend, Mrs. Helga Brichet, Past President, WFRS, and Chairperson of the WFRS Committee on Conservation, to visit Ooty, so she could assess its potential for the award. After going round the garden, and appreciating it, especially as it was in full bloom though it was a cold January morning (in 2005) she remarked to the entourage following her - mainly Horticulture Dept. Officers and the press - that she strongly recommended that an area be left apart for growing such species and heritage roses, as would do well in Ooty climate. This would be a way of preserving these roses, as many are endangered, some even gone.

Well, as we all know the Centenary Park received the Award of Garden Excellence at the World Convention in Osaka, Japan in 2006, largely due to the recommendation of Mrs. Brichet.

Since then, we have been persuading the Horticulture Dept. of the Government of Tamil Nadu that it behoved us to listen to the suggestion made by Mrs. Brichet about setting up a heritage garden within the Centenary Park. We informed the Government that we would be willing to donate all the species and old roses required for such a garden.

Finally, after many discussions, the Government approved the project, and in April 2008, the first steps for initiating the making of the garden were taken, We visited Ooty, along with Mr. G. Kasturirangan and his son, Mr. Sriram, both of KSG Sons, Bangalore. We must record our appreciation for the constant support given by them for this project. The first steps were to locate areas within the garden, which could be made into the heritage garden We decided that it would be better to have two areas, one for species roses and one for OGRs.

After ‘casing the joint’ as they say criminals do, in detective stories, we zeroed in on what are called 'The Fountain Bed' and the 'Well Bed'. Actually it was Sriram who pointed out to us how appropriate these beds would be for our purpose, and once we looked at these areas with new eyes, we saw how right he was.

Both these beds are to one end of the garden, and relatively unused. The Fountain Bed, apart from a fountain, had no plants growing. It was a squarish area, with a tall cypress hedge on one side, and a curving slope on another. There were curving steps behind this slope, which led up to the Well Bed. The Well Bed area had a circular rose bed around the well, a little summer house to one end, and a beautiful grassy slope curving all along, from what we could have as the entry point arch to the heritage garden, in a wide circle right to the back of the area. Just perfect for growing ramblers.

We spent days on the site, planning the landscaping of the two gardens, and deciding on the structures required - arches for the climbing roses, pillars for standards, fences and catenaries for more climbers. We drew up detailed plans, sets of which were given to the park authorities, so they could start the digging of the beds, and order for the structures. Dr. Selvaraj, Joint Director, Horticulture, was most supportive and agreeable to all our requests (unfortunately he has since been transferred), Mr. Jagdish Kumar, Asst. Director, Horticulture, was very receptive to all our ideas, and most important, Mrs. Uma Rani, Manager of the Park, was an eager acolyte, willing to carry out all the tasks needed to have done, in order for the garden to take shape. We hope that the last two officials will continue in their posts till such time as the heritage garden is completed.

A visit in June 2008 was made (Kasturirangan and Sriram came too) to actually draw on ground the dimensions of the beds, and the placement of the structures (which still had to be ordered), Some alterations were required (as often happens when paper plans are translated to ground realities) and these were finalized.

September saw us all again in Ooty, this time bearing rich gifts of plants. All through we had been assiduously making plants of all the species and heritage roses we have growing in our own garden, and we had also sent budwood to Kasturirangan for him to make more plants. So he from Bangalore and we from Kodaikanal converged on Ooty, in vehicles laden with roses. Ours looked like a forest, as we had to pack a very large *Rosa gigantea* in twists into the boot, apart from *R. clinophylla, R. bracteata, R. laevigata* and others.

We have made lists of the different classes - Teas, Chinas, Hybrid Perpetuals, early Hybrid Teas, ramblers, Bourbons etc.

Mrs. Uma Rani had prepared the Fountain Bed garden, with the two triangular beds and the circular bed round the fountain itself, which we had envisaged, so we planted all the species we had taken. We also planted the species in places where the fences need to come up.

In one triangle bed we planted the species, *cooperii, rugosa, sempervirens prostrata, laevigata, roxburghii normalis*, and a form of *multiflora*.

In the second triangle bed were planted *indica odorata, multiflora watsoniana, clinophylla, banksia lutea, wichurana* and *roxburghii plena*.

Where a fence in front of the cypress hedge is to be kept (we kept a safe distance from the hedge, to, hopefully, prevent roots from encroaching) we planted *R. brunonii* at one end and *R. longicuspis* at the other.

On the opposite slope, near the steps leading upwards to the Well Bed, we planted three plants of *R. gigantea*, to be trained on the slope when they get bigger.

In the Well Bed, where we had wanted a long bed from the Entry Arch to the curving steps leading down to the Fountain Bed, digging showed up nothing but big boulders. These had all to be removed and soil replaced. Apparently the earlier intention for this area had been to have a parking area, so the boulders had been rammed in, prior to concreting. That idea seems to have been abandoned, but as nothing had been planted earlier to our arriving on the scene, the boulders continued. We found more boulders in the areas we marked for pits for the arches and climbing roses. Here too, the stones had to be removed, and the climbers planted, though the arches had still to be placed in position. Actually, we were in a dilemma - wait for the arches to be positioned (which could take all of many months, since the order for the structures were still only being contemplated upon) or plant the roses and let them grow, and hope that when the arches are kept, care would be taken that no cement would fall upon the plants. Mrs. Uma Rani assured us that she would take abundant caution and care when the structures were being erected, so we decided to plant all the climbers we had taken.

October and November being heavy monsoon rain months, not much progress was possible. All the old, earlier planted roses in the large circular bed around the well in the Well Bed have been removed and planted elsewhere. This is because the soil would have become 'rose sick’ and needed to be amended/changed.

We have requested the authorities to have, apart from rose name boards, big boards with explanatory texts erected in each area.

Once the budded plants have grown sufficiently, in our garden and in Kasturirangan’s farm near Bangalore, they will be taken and according to the landscape plan, planted down in the appropriate beds. This process will be long drawn out, as these old beauties, being rare, have to be coddled with special care. We feel that it will take about 2 years for the entire heritage garden project to be completed. But this is a labour of love for us, and we hope that when finished, it will be a good learning tool for aspiring rose researchers and breeders, apart from the general rose grower.

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We spent days on the site, planning the landscaping of the two gardens, and deciding on the structures required- arches for the climbing roses, pillars for standards, fences and catenaries for more climbers. We drew up detailed plans, sets of which were given to the park authorities, so they could start the digging of the beds, and order for the structures. Dr. Selvaraj, Joint Director, Horticulture, was most supportive and agreeable to all our requests (unfortunately he has since been transferred). Mr. Jagdish Kumar, Asst Director, Horticulture, was very receptive to all our ideas, and most important, Mrs. Uma Rani, Manager of the Park, was an eager acolyte, willing to carry out all the tasks needed to have done, in order for the garden to take shape. We hope that the last two officials will continue in their posts till such time as the heritage garden is completed.

A visit in June 2008 was made (Kasturirangan and Sriram came too) to actually draw on ground the dimensions of the beds, and the placement of the structures (which still had to be ordered). Some alterations were required (as often happens when paper plans are translated to ground realities) and these were finalized.

September saw us all again in Ooty, this time bearing rich gifts of plants. All through we had been assiduously making plants of all the species and heritage roses we have growing in our own garden, and we had also sent budwood to Kasturirangan for him to make more plants. So he from Bangalore and we from Kodaikanal converged on Ooty, in vehicles laden with roses. Ours looked like a forest, as we had to pack a very large *Rosa gigantea* in tortuous twists into the boot, apart from *R.clinophylla, R.bracteata, R. laevigata* and others.

We have made lists of the different classes – Teas, Chinas, Hybrid Perpetuals, early Hybrid Teas, ramblers, Bourbons etc.

Mrs. Uma Rani had prepared the Fountain Bed garden, with the two triangular beds and the circular bed round the fountain itself, which we had envisaged, so we planted all the species we had taken. We also planted the species in places where the fences need to come up.

In one triangle bed we planted the species, *cooperii, rugosa, sempervirens prostrata, laevigata, roxburghii normalis*, and a form of *multiflora.*

In the second triangle bed were planted *indica odorata, multiflora watsoniana, clinophylla, banksia lutea, wichurana and roxburghii plena.*

Where a fence in front of the cypress hedge is to be kept (we kept a safe distance from the hedge, to, hopefully, prevent roots from encroaching) we planted *R.brunonii* at one end and *R. longicuspis* at the other.

On the opposite slope, near the steps leading upwards to the Well Bed, we planted three plants of *R.gigantea*, to be trained on the slope when they get bigger.

In the Well Bed, where we had wanted a long bed from the Entry Arch to the curving steps leading down to the Fountain Bed, digging showed up nothing but big boulders. These had all to be removed and soil replaced. Apparently the earlier intention for this area had been to have a parking area, so the boulders had been rammed in, prior to concreting. That idea seems to have been abandoned, but as nothing had been planted earlier to our arriving on the scene, the boulders continued. We found more boulders in the areas we marked for pits for the arches and climbing roses. Here too, the stones had to be removed, and the climbers planted, though the arches had still to be placed in position. Actually, we were in a dilemma – wait for the arches to be positioned (which could take all of many months, since the order for the structures were still only being contemplated upon) or plant the roses and let them grow, and hope that when the arches are kept, care would be taken that no cement would fall upon the plants. Mrs. Uma Rani assured us that she would take abundant caution and care when the structures were being erected, so we decided to plant all the climbers we had taken.

October and November being heavy monsoon rain months, not much progress was possible. All the old, earlier planted roses in the large circular bed around the well in the Well Bed have been removed and planted elsewhere. This is because the soil would have become 'rose sick' and needed to be amended/changed.

We have requested the authorities to have, apart from rose name boards, big boards with explanatory texts erected in each area.

Once the budded plants have grown sufficiently, in our garden and in Kasturirangan's farm near Bangalore, they will be taken and according to the landscape plan, planted down in the appropriate beds. This process will be long drawn out, as these old beauties, being rare, have to be coddled with special care. We feel that it will take about 2 years for the entire heritage garden project to be completed. But this is a labour of love for us, and we hope that when finished, it will be a good learning tool for aspiring rose researchers and breeders, apart from the general rose grower.

Indian Rose Annual - IRA 2010

On The Trail of Two Knights

Sir George Watt and General Sir Henry Collett

Girija Viraraghavan

In the late 1980’s we got a copy of Ellen Willmot’s ‘Genus Rosa’ which was published in 1914. She deals with rose species of the world, and going through it, we realized that, apart from the swamp wild rose species, *Rosa clinophylla*, about which we had heard before, and had been able to procure, from the wild, there was another species, *Rosa gigantea,* which is native to a particular area in India’s north east region. Reading the description of this species by a Sir George Watt from whose unpublished diaries, Miss Willmot had taken an extract, we became excited. Sir George Watt found this wild rose, which, he wrote, looked like huge yellow magnolias hanging from the branches of tall trees, in 1882, in the forests off Ukhrul town in Manipur State, when he was part of a commission to demarcate the boundary between India and Burma (as it was known then). Researching a little more, we found that at practically the same time, that is, 1888, a General Sir Henry Collett found the same wild rose growing in the Shan Hills of Burma. Whilst trekking he saw at a distance of 2 miles something large and white, and seeing it through his looking glass (binoculars) he realized it was a rose. He sent off seeds and stem specimens to the leading taxonomist of the time, Monsieur François Crépin, who was attached to the Botanic Garden in Meisse, Belgium, and suggesting that if it was a new species, it should be given the name ‘gigantea’ as the flowers were exceedingly large.

Sir George Watt called his found species *Rosa macrocarpa*. When M. Crépin compared the two sets of specimens sent by the two enthusiastic botanists he found that both the Indian and Burmese plants were the same, and gave the name *Rosa gigantea* to this species. The Indian form which Watt discovered, is much creamier, indeed very yellow as a bud, than the Burmese form, which is white. On ageing, however, *macrocarpa* becomes white. Sir George however seems always to have believed that his species was different.

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After early morning tea, (this itself was quite a feat, as the Naga tribesman who was the caretaker of the state guest house we stayed in dared not be woken by our driver, who feared that in the normal tradition of the fierce Nagas, he would be greeted by a knife before any questions were asked!) we set off, driving up the mountainous forest path to a fair distance, before the road gave out and we had to walk. Suddenly we saw a huge creeper going up a tall tree. Stopping to check, we realized we had hit ‘pay dirt’. This was a rose with the largest leaves imaginable, and a number of very big yellow orange hips, but with no flowers. They would have flowered earlier in the season – in the icy winter now, there were only hips, which would be from the last year’s flowering season. We were elated at the thought that this could have been the same location, or at least, the very same area where Sir George had found his specimen. We collected some hips and some cuttings and returned to carefully pack them for the long journey back home in southern India, by air, train and road.

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Who were these gentlemen? Sir George (1851-1930) was a surgeon with botanical interests and he came out to India to be employed as a lecturer in Botany in a Calcutta college. Unfortunately by the time he arrived the place had been filled, so the East India Company which had brought him to India, sent him off on various assignments. One was as part of a commission to demarcate the India-Burma border, and it was on this trip that he discovered *R. gigantea*. There were many other plant species he discovered - among them, *rhododendron maccabeanum*, and a *primula (wattii?).* But what makes Sir George Watt a lasting benefactor to India is his stupendous and monumental 12 volume “Dictionary of Economic Products of India”. Sir George returned to Scotland and settled in the Dumfries region to which he belonged. He was born in Old Meldrum and died in Lockerbie.

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After we registered our two gigantea hybrids, named for these eminent hobbyist-botanists, in 2008, as ‘Sir George Watt’ and ‘Sir Henry Collett’, we thought it would be a good idea to try and locate any descendant families to inform them that we had taken the privilege to name roses after their illustrious forebears. But for a long time we could not get any leads - of course our interest was an on and off pastime. We checked with the Royal Botanic Garden, Edinburgh, (Sir George spent much time there in his last days, he taught Indian Botany in a college nearby) and with botanist friends in the UK, but they said that getting this kind of information would be very difficult, especially in these days when families are scattered all over the world.

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Copies of the original

Indian Rose Annual 2010

and

Two additional stories related to the article

“The adventures to bring roses from India to Scotland”

and

Two articles in Eskdale & Liddesdale Advertiser

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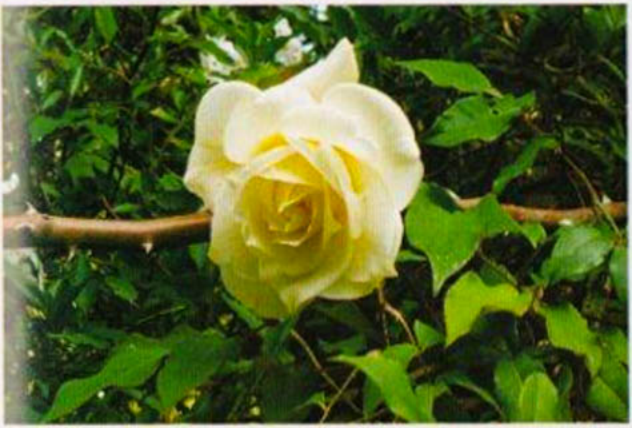
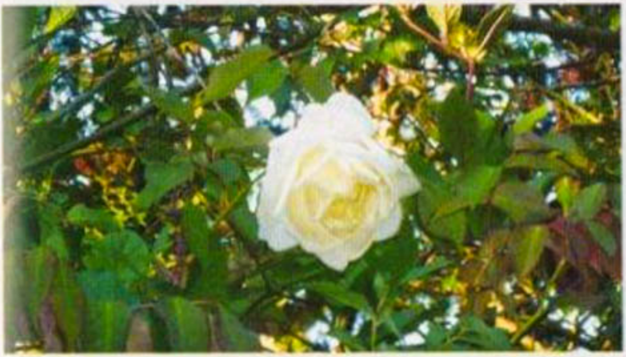


'Sir George Watt'
(Reve d' Or x *R. Gigantea*)
M.S. Viraraghavan



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Sir George Watt.
Photo Courtesy : Archives of the Dumfries and Galloway Health Board, Dumfries, Scotland

Who were these gentlemen? Sir George (1851-1930) was a surgeon with botanical interests and he came out to India to be employed as a lecturer in Botany in a Calcutta college. Unfortunately by the time he arrived the place had been filled, so the East India Company which had brought him to India , sent him off on various assignments. One was as part of a commission to demarcate the India-Burma border, and it was on this trip that he discovered *R.gigantea.* There were many other plant species he discovered— among them, *rhododendron maccabeanum*, and a *primula (wattii?)* But what makes Sir George Watt a lasting benefactor to India is his stupendous and monumental 12 volume "Dictionary of Economic Products of India". Sir George returned to Scotland and settled in the Dumfries region to which he belonged. He was born in Old Meldrum and died in Lockerbie.

In this group photograph taken in 1880. General Sir Henry Collett, (then captain) is seen bending over a book.
Photo Courtesy : The National Army Museum, London

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Herbarium Specimen of *R. gigantea*
collected by Sir George Watt in1882, in Manipur,
at the Royal Botanic Garden, Edinburgh
Courtesy : Mr. Henry Noltie

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Herbarium Specimen at the Royal Botanic Garden Edinburgh of *R. involucrata* (now *R. clinophylla*) collected by Sir George Watt in 1882, in Manipur

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No matter race of color
No matter rich or poor
We can all enjoy the roses
That may grow at our door

Ralph Moore

from "How Much Alike"

ROSA GIGANTEA - 'SIR GEORGE WATT' PART II INCLUDING 'SIR GEORGE WATT 'ESCORTS 'BANARASDAWN' TO SCOTLAND

BY GIRIJA VIRARAGHAVAN

Morag Williams

Readers of the Transactions issue LXXXIV2010 will recall the story of Rosa Gigantea 'Sir George Watt', which ended on a note of hope that the rose might be grown successfully in Scotland.

There was great despair at the lack of success of the various packages which had been sent from India at considerable cost by the ever-hopeful Girija Viraraghavan and her husband, Viru. In Scotland, Richard Baines at Logan Botanic Garden in the West of Dumfries and Galloway remained just as optimistic and willing to keep trying to achieve success.

After two failed attempts Morag Williams perhaps planted the seed of an idea in Girija's mind, which lay dormant because there did not seem to any possibility of its happening. She said that the main reason for the lack of success seemed to be the time taken by these tender cuttings to reach their destination in Scotland and receive attention. If only someone travelling from India to the UK could bring them by air it would improve the chances of success. Better still, if a rooted plant, instead of cuttings, could arrive by this means there would be greater hope of a successful outcome. Even so, such a move would provide another hurdle to overcome: a plant would require certification to travel.

There follows in Girija's own words the second instalment of the journeying of the Rosa Gigantea 'Sir George Watt 'from India to Scotland, which first appeared in January 2011 in The Indian Rose Annual

XXVII2011. Girija has kindly given consent for publication in the Transactions.

'Sir George Watt' Escorts 'Banaras Dawn' to Scotland

by Girija Viraraghavan[1]

In September 2009 we received an email message:

My name is Ruhi Thallon (nee Saxena). My father, Major Prem Saxena, cultivated and registered a rose, 'Benares Dawn'. I did not know my father, as my mother left him when I was two years old. Unfortunately I was not able to make contact with him before he died. I have met my relatives and half siblings who resided in Dehra Dun and they told me dad had cultivated a couple of roses, however 'Benares Dawn' is the only one registered.

I am keen to find out more about this rose and, if possible have one to grow in my garden in Scotland. I would also like it for my mother, now 82 and still not over my father! Would you know if Doon Roses in Dehra Dun are still in business and whether there is any chance this rose may still be in existence?

I replied:

What a pleasant surprise to get your mail. And we can well empathise with your nostalgic search for a rose raised by your father.

Viru remembers the rose 'Banaras Dawn' and has heard of your father. But we do not know if the variety is still available. We looked up our old rose catalogues and we find that Friends Rosery, Lucknow, had listed it in their 1988-89 catalogue. This is what it said:

'BANARAS DAWN: (Maj. Saxena, Introducer: Doon Valley Roses) Rs. 10/-, The first Indian bred apricot coloured rose with gold base, with as many petals as in Medallion but much deeper in colour, more shapely and more fragrant. Very fioriferous on long strong stems.'

We will try to scout around among our rose friends, some of whom are nurserymen, and see if they can come up with any answers. We do not think Doon Roses is in existence any more.

I do not want to raise your hopes, however, because over the years we have found many old Indian raised varieties have disappeared - many of my husband's early ones too. We have not been able to keep even the mother plant as he was on a transferable job till he retired.

I will ring up our good friend Mr G. Kaslurirangan who owns KSG Sons, the biggest rose nursery in India and ask about 'Banaras Dawn'.

Unfortunately, Mr. Agarwal who owned 'Friends Rosery', Lucknow, and who catalogued this rose, passed away many years back.'

(Benares is the name of a holy town on the banks of the River Ganges, and is spell either 'Benares' or 'Banaras'. The variety had been registered as 'Banaras Dawn')

Ruhi wrote that her father died in 1975 but the rose was registered in 1979 and Modern Roses 10 listed it. She was naturally unhappy that he did not know his rose had been registered and therefore all the more determined to try and find a plant. We wondered who had registered it, because in those days all registrations had to be done through the I.A.R.I. (Indian Agricultural Research Institute), which would forward the forms to the I.R.R.A. (International Rose Registration Authority), U.S.A., and not directly as can be done now. Perhaps the late Mr. Arpi Thakur, owner of

Doon Valley Roses, had sent in the registration.

We rang Kasturirangan and were pleasantly surprised (actually we shouldn't have been, as Kasturi, as he is affectionately called, is the repository of an unbelievable number of varieties, old and new) to hear him say, 'yes, I know 'Banaras Dawn' and I have a mother plant'. We told him about Ruhi Thallon and her search and requested him to bud a few plants for her. He agreed and we lost no time in emailing Ruhi with this good news. She was naturally delighted and emailed him and also rang him to thank him.

Plants were budded straightaway, at Kasturi's farm on the Bangalore-Mysore Road, but it took many months for them to grow to a reasonable size - a size where they would recover from the trauma of being transported, bare-root and nearly dry, all the way from Bangalore, India, to Hunter's Quay, near Dunoon, Argyll, Scotland, where Ruhi lives.

Ruhi and we were in constant touch, she fretting at the slow growth, impatient to see them in her garden, and we reassuring her that they were growing and that Kasturi was the best judge of when they would be ready to take flight.

A parallel tale: We had been trying to send plant material of our variety, a Hybrid Gigantea, named for Sir George Watt (who had discovered *R. gigantea* in Ukhrul area, in Manipur State, north-east India) to a botanic garden in Scotland. (Please see my article 'A Tale of Two Knights', I.R.A. 2009). Several parcels, with proper documentation, had been dispatched over the past year, with no success. Once a postal strike in the U.K. delayed delivery over-long, another time the weather was bitterly cold, so the cuttings wouldn't root and a third time, though the stems reached in record time, somehow they didn't 'strike'. We were despondent, as was our friend in Scotland - Morag Williams, the retired Archivist of the Dumfries Hospital (where Sir George Watt, and later his son, had worked) who had been instrumental in sending me precious information about Sir George Watt himself, and putting me in touch with his descendants. We were at our wits' end wondering how to deliver 'Sir George Watt' the rose plant to the environs of where Sir George Watt, the person, had lived and worked.

Surprisingly, another hybrid gigantea bred by Viru, (with the same parentage as 'SGW') and named 'Sir Henry Collett', after the other knight who discovered the species gigantea in Burma (in the Shan Hills) has proved much easier to root from cuttings and has reached southern France and Kent. Just shows how very different siblings can be!!

Suddenly the bright idea occurred to Viru that if we could bud a plant of 'SGW' and grow it to a reasonable size, we could add it to the parcel of 'Banaras Dawn' plants and send them all together to Scotland. Our budding was successful and after a few months we had a strapping plant.

Kasturi called us up in August 2010 (earlier, I had been really bugging him, telephoning every so often to enquire about the growth of the 'Banaras Dawns') to say the plants had reached the size where travel would not affect them. We requested him that when he applied for the phyto-sanitary certificate and all other documentation necessary for sending a parcel of rooted plants he should add 'Sir George Watt' to the list. He readily agreed. But then waiting for the documentation to be completed took all of a month and more - typical bureaucratic delays.

Finally one very rainy afternoon he called to say 'the certificates will come tomorrow, so please courier 'SGW' at once so it can be taken along with 'B.Ds.' to the Quarantine Office'. In pouring rain we rushed out, pruned, washed and cleaned up the roots and packed and couriered the plant - from Kodaikanal (where we live) to Bangalore (to Kasturi).

The parcel was finally ready to be sent by an international courier service to an eagerly waiting Ruhi. It so happened that a few days after we had sent 'SGW' to Bangalore we ourselves had to go there as we were keen to attend our very good friend Kasturi's 80th birthday - 'Shatabhishekam' as it is called on 29th September. We met his nephew, Sanjay, who had come for the function from London and who offered to carry the precious parcel personally and post it to Ruhi as soon as he returned back home. This seemed a better idea than the courier. The parcel rested in the refrigerator till such time as Sanjay was to leave, just a few days later. But a problem cropped up. We couldn't contact Ruhi for some days so instead we rang Morag and requested her to accept the parcel, and introduced her to Ruhi. Later when they contacted each other, they made arrangements to meet up at the Royal Botanic Garden Edinburgh - which they did, after a nail-biting delay in the parcel reaching Morag. We were relieved to hear that all the plants were green and in good condition. They are now in the Botanic Garden's quarantine area for three months. Hopefully they will survive and come through the bitter winter - remember they are Indian and acclimatized to warmth.

We are all keeping our fingers crossed - that 'Banaras Dawn' will finally bloom for Ruhi and her mother in Hunter's Quay, Dunoon, and that 'Sir George Watt' will grow - luxuriantly in the gardens he created - in the

Crichton Royal Hospital, Dumfries, and his grandson's former garden at Rosevale in Langholm, all in Scotland.

Morag takes up the story…

Girija is not exaggerating when she speaks of nail-biting. Sanjay arrived back in London on the Sunday. He posted the parcel to Scotland as soon as possible.

There are other key people in the story: none more so than Richard Baines at Logan Gardens, who smoothed the path for Rosa Gigantea hybrid 'Sir George Watt' to be received into the care of the staff of the quarantine department of the Royal Botanic Garden in Edinburgh.

It was fortuitous that Morag and her husband had an appointment in Edinburgh that week. It was crucial that the parcel should arrive by the Thursday and in time for them to keep an appointment in Edinburgh. It had not arrived by the Wednesday. Would it arrive on the Thursday and in time? Meanwhile Ruhi was on tenterhooks in Dunoon wondering if she would be making a trip to Edinburgh that day, too. Thankfully the parcel arrived and everyone involved set off.

Morag was welcomed by Bruce Robertson at the Royal Botanic Gardens. Ruhi had the longer journey and, as lunch-time was fast approaching, it was decided that the parcel should be taken to the quarantine department for inspection because everyone was eager to discover how the plants had stood up to their long journey in an unnatural environment.

Thanks to the specialist knowledge and careful packing by our Indian friends, it was a joy to discover how remarkably fresh-looking they were, despite imprisonment over several days. Rosa Gigantea hybrid 'Sir George Watt' emerged as a sturdy, stripped-back plant about 16 inches high. There was some unwelcome news for Ruhi, however, when she arrived. The three Banaras Dawn plants had been admitted to quarantine and would not be allowed to go to Dunoon until given a clean bill of health. Given that it was late October, she was quickly persuaded that all the plants stood a better chance of survival if the first winter in Scotland were to be spent in the most benign conditions available right there in Edinburgh.

Early in February 2011 after a second severe winter in Scotland Morag received an email from Bruce Robertson.

The rose is alive, well, out of quarantine and living up to the specific epithet i.e. 'gigantea'. Your rose has not been outside so it hasn't had to deal with our harsh winter. It has put on quite a considerable amount of growth. There is a small bit of die-back at the top of the original cutting but I think this is perfectly normal and the new growth all appears to be healthy.

We are thinking of sending the rose to Logan and then hopefully they can propagate it. I cannot help but think that this particular rose is tender. This small but crucial fact should, I think, be borne in mind when the rose is planted out and eventually distributed.

All concerned were delighted at the news and before the end of February a second email arrived to say:

The rose is now at Logan. Richard Baincs collected it yesterday and took it back along with another rose and some conifers. If you consider what the rose looked like when it first arrived here, then there has been quite a transformation. The main growth is about three feet long. Probably because it has been indoors the foliage is in quite good condition and rather attractive.

In May a delighted Ruhi saw the first delicate apricot-coloured bud of her father's rose and was able to breathe in its delicate fragrance. Meanwhile Morag visited Logan Botanic Garden in May to witness the progress of the Rosa gigantea hybrid.

Richard Baines greeted her with the surprising news that the rose had been planted outside the day before. This much-travelled specimen has been placed in a sheltered spot against a high, south-facing wall in one of the most hospitable garden climates in Scotland, as it benefits from the warming influence of the Gulf Stream. Richard said on that occasion that he confidently expected it to bloom in 2012.

However, in mid-August 2011, an e-mail arrived from Richard Baines to say that the rose was in bloom 'and doing very well'. The skills of the Royal Botanic Garden staff in Edinburgh and at Logan had brought about Viru and Girija's desired objective of having the rose grow in Scotland, Sir George Watt's native country. This had been achieved ahead of schedule and, remarkably, in an outdoor situation. Richard's seemingly incredible optimism, voiced in May, was more than justified. There were whoopees all the way from Dumfries and Galloway to South India!

When we were returning to India from the US in 2013 we stopped by in Scotland. In the background of this visit was our hybrid gigantea rose, ‘Sir George Watt’, named in honour of the discoverer of the species gigantea in the mountains of Manipur State in 1882. Sir George Watt was one of the most distinguished ‘renaissance’ men of his times, with a matchless contribution not only in botany but also in education, art and science. One of his greatest accomplishments was the monumental 9 volume Dictionary of Economic Products of India, written as far back as 1906, but still a standard work of reference.

After our successful trip in 1990 to the same area where Watt collected *R. gigantea,* we had named a rose for him. With the help of Mr. Kasturirangan of KSG Sons, we had successfully sent a plant to be grown in the Logan Botanic Garden in south-west Scotland, very near the area where Sir George had lived after his return from India.

As a prelude to our present visit we had established contact with several of his descendants and family friends, as well as with Morag Williams, the archivist at the Royal Crichton Hospital where he had worked. It was arranged for us all to meet and drive to Logan to see the rose planted there by Curator Richard Baines. It was an inspiring moment to see it climbing over 15 feet high on the enclosed garden brick wall, looking perfectly at home. Sadly not in bloom - apparently it flowers only in late August.

Hoping for a rose garden

Published at 21:38, Wednesday, 05 October 2011 in Eskdale & Liddesdale Advertiser

THE contribution made to India by Eskdale's Sir John Malcolm, whose achievements are commemorated on the monument on Whita Hill, is well-documented.

The Rosevale Street garden where it is hoped one day the Rosa Gigantea flower may be planted

Less well-known is the legacy of Sir George Watt, surgeon and botanist who was born in Aberdeenshire and worked in India before retiring to Lockerbie where he died in 1930.

The Rosevale Street garden where it is hoped one day the Rosa Gigantea flower may be planted

The name George Watt may ring a bell with some of our readers because it was also the name of Sir George's grandson who practised medicine in Langholm as did his father Dr Robert Watt.

Sir George's achievements in India have come to light through Morag Williams, the Dumfries Crichton's retired archivist, who has also written the history of the Thomas Hope hospital.

Dr Tom Kennedy will introduce Morag at the archaeological society's next meeting when she will speak about a special flower which Sir George discovered growing wild in north-east India and now bears the name Rosa Gigantea because of the size of its bloom.

In an article in the E&L in October 2009 Tom wrote: "A new rose with Langholm connections has been cultivated in India and it is hoped that it may one day be planted in the Rosevale Street garden."

In 2010 an article pertaining to this bloom appeared in the magazine of the Indian Rose Federation. It was written by Girija Viraraghavan and told of Girija and Viru's search for details of the Rosa Gigantea.

They had read a description of it by Sir George who, in 1882, had found this wild rose which, he said, looked like huge yellow magnolias hanging from the branches of tall trees.

These two Indian rosarians set out to follow in his footsteps in search of the rose which he'd named Rosa Macrocarpa. But, because it was winter in India, they found only the rosehips which they collected, along with cuttings.

Back home in southern India Viru bred this rose and in 1995 the couple saw their first flower and called it after Sir George. After registering the rose in 2008, they started tracing Sir George's family.

This proved difficult but, eventually, through the internet they found his obituary in the

London Times. It mentioned his son, Dr Robert Honey Watt and, by chance, an archival history of the Thomas Hope Hospital came up on the screen, mentioning Dr Robert's son, George, who had joined his father in the practice. This, of course, is the Dr George Watt who lived in Rosevale House in Rosevale Street.

Having contacted Morag, who had written the history of the hospital, Girija was given Tom Kennedy's email address. As she says in a very Indian turn of speech "since then there have been such a flurry of emails that I cannot restrain my whoopees".

When he came to live in Dumfriesshire, Sir George was convener of the gardens committee at the Crichton and one of those responsible for the ambitious design of the Crichton gardens, including the stunning rockery.

The E&L article of 2009 noted that these gardens had a spill-over effect on the gardens at Thomas Hope. Grandson George, himself a keen amateur botanist, took a great interest in the hospital gardens. He donated the Rosevale Gardens, opposite Rosevale House, to the town when they became too much for him.

Former Langholm GPs Mike Tinker and Tom Kennedy pursued Morag's quest for the descendants of the Watt family and have contacted Dr George's two sons, Nigel, who lives in New Zealand and Richard in Carlisle.

Nigel still has the rosewood spears which he and Richard used to throw around in the garden at Rosevale, the stout stems of the Rosa Gigantea being used by the Naja tribesmen as walking sticks and spear shafts.

If you want to hear more, go to the archaeological society meeting on Wednesday, October 19 in the Buccleuch Centre when Morag will tell the story of Sir George's rose. Everyone is welcome.

Everything coming up roses for Morag

Last updated at 11:33, Thursday, 03 November 2011 – published in Eskdale & Liddesdale Advertiser

THE story of Sir George Watt and his rose was told to an attentive audience at the Eskdale & Liddesdale archaeological society in Langholm.

Morag Williams, former archivist at Dumfries & Galloway health board, is known for, among other achievements, writing the definitive history of the Thomas Hope Hospital.

She came to tell the story of Sir George Watt and his rose and began by showing a photo of Viru and Girija Viraraghavan in their rose nursery in southern India.

Viru, a rose grower, and his wife, Girija, who does all the research and correspondence, rediscovered rosea gigantea growing wild in the forests of Manipur, a mountainous area in eastern India, in 1990.

Sir George Watt (1851-1930) had been there in 1888 and discovered this great rose, with blooms like yellow magnolias hanging from the branches of tall trees. He was then with the East India Company and was on a commission to demarcate the Indian Burmese border.

Sir George wrote a 12-volume Dictionary of Economic Products of India, a standard reference work. On returning to Scotland, he settled in Lockerbie and was soon helping with the planning and laying out of the Crichton Royal Gardens in Dumfries, providing many seeds from his collection. In particular there are still in the gardens four “handkerchief trees” (Davidia involucra).

His grandson Dr George Watt was chairman of the garden committee from 1966 to 1971.

How Viru got the rose to grow in his southern Indian gardens; how Girija assiduously sought out Sir George’s descendants; and how, eventually, after several failures, the rose is now growing – it bloomed last summer at Port Logan Gardens – all made a fascinating tale.

Disappointingly, it is unlikely that the rose would withstand our stern Eskdale climate.

Richard Watt was unable to come but had sent some photos of George and Patricia Watt holidaying with him in the Highlands & Islands.

Dr Mike Tinker lent his abridged copy of Sir George’s dictionary, along with a document chest which Sir George had with him in Delhi in 1903. Through Mike’s kindness they will form part of the Sir George Watt archive in Dumfries.

Avril Bannatyne proposed the vote of thanks to Morag and her husband, John, who was in charge of the slide show which accompanied the talk.

Indian Rose Annual - IRA 2011

Patio Teas – A new Class in the making?

M.S.Viraraghavan

Rose experts have always stressed that bringing in the genes of new rose species can lead to unexpected results some of which can be very interesting and beautiful indeed. I never expected that I would have a chance of proving this theory correct, which has happened with the new line of 'Patio Teas', referred to by Arun Patil, in his write up on 'Minifloras' in this annual.

It all started when I began crossing *R. clinophylla* with the dark pink Tea rose, 'Mrs B.R.Cant' which does well in India. Out of a large number of seeds harvested from this cross only two germinated, out of which only one made it to maturity. This was a rather weak growing plant with single flowers in pink, but repeat flowering - the latter quality does not often manifest itself in direct crosses with species. This seedling was re-crossed into 'Mrs B.R. Cant' to produce a dark pink Tea like rose nicknamed 'Pink-Pink'. Taking the strain further, 'Pink- Pink', was crossed into the Noisette climber 'Rêve d'Or' which does very well under Indian conditions. A most unexpected result was the emergence of several seedlings, all very dwarf, (not more than 1 foot high after several years) bearing flowers of the Tea rose type, but smaller. There was a wide color range, ranging from light pink, dark pink, lilac and apricot with a lot of variety in flower form, ranging from H.T. form, to cup form, to old rose form. One seedling which stood out from the rest was a short climber in yellow shading to apricot brown but sadly once flowering, unlike its sister seedlings which flowered continuously.

Further crosses of the dwarf 'Rêve d'Or' x 'Pink Pink' seedlings x Tea roses produced several short plants which looked like typical Tea roses but considerably dwarfer, not more than a foot high under the cool Kodaikanal conditions, but likely to be somewhat taller on the plains. One of these is pictured herein.

Bringing in the China roses into the 'Rêve d'Or' series has produced another type of dwarf Tea, or should I call it 'dwarf China' roses with a very interesting flower form, like a chrysanthemum with quilled petals. The China rose used in this cross was an extraordinary old variety discovered by the eminent Italian rose collector, Mr. Vicky Ducrot, as well as the great plant botanist Martyn Rix of the U.K, in the ’Monastery of the Ten Thousand Camellias’, in Lijiang, China. The ancient camellia bush growing in this temple is reputed to bear 10,000 flowers every season. The resultant seedling is pictured alongside.

This range of Patio Teas is now being tested out for suitability under standard garden conditions and hopefully, will be released in the near future. If all goes well, these new kinds should be well suited for today’s smaller gardens or for pot culture.

Copies of the original

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"Hill View" Fern Hill Road, Kodaikanal - 624 101. Tamilnadu

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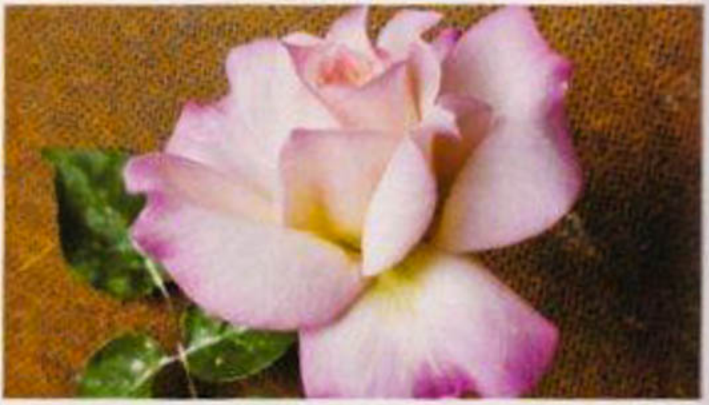
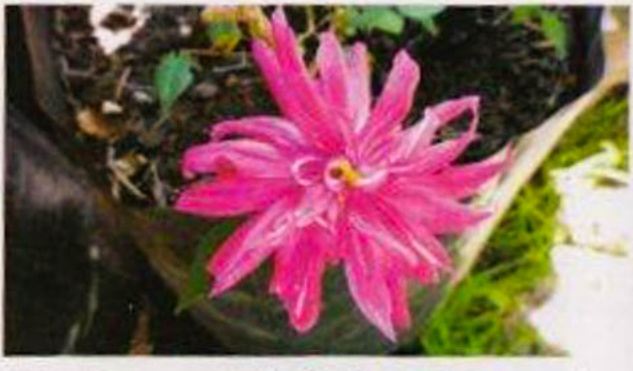
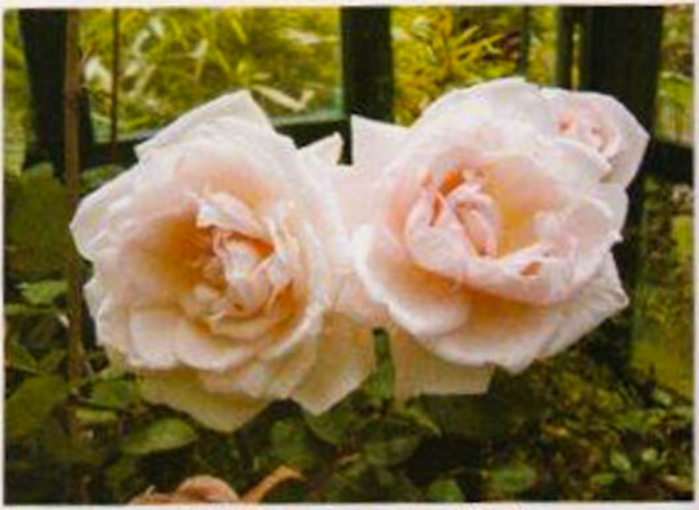


Reve d'or X *R. clinophylla* derivative

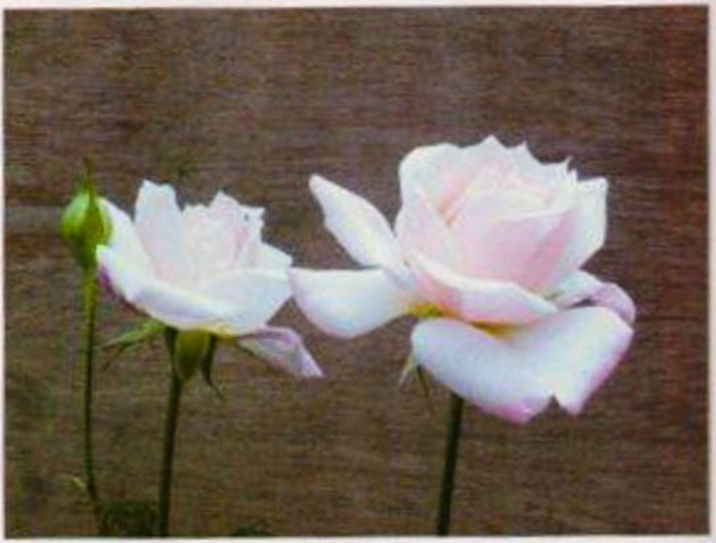


***R. clinophylla* Derivative X Ten Thousand Camellias Temple China**

Photos by M.S. Viraraghavan



Padmasambhava (Lotus Born)



Narendra

Photos by M.S. Viraraghavan

Indian Rose Annual - IRA 2012

Mystery Roses of India

Girija and M.S. (Viru) Viraraghavan

If you look at the world map it is quite clear that India is well placed to have received a flood of roses from the two great centers of wild and historical roses – China, and Persia (now Iran) and the Middle East. This, together with the fact that India's social order was severely disrupted by 700 years of foreign rule makes it rather appropriate to describe the country as, with apologies to Fitzgerald and Omar Khayyam, "a battered caravanserai whose alternate portals are east and west".

It is quite fascinating to chronicle how roses reached India in so many ways but sheer numbers would have made it impossible to do justice to the subject but for the fact that most of India having an unfavorable climate for roses, resulted in rapid extinction of many of the new rose introductions arriving from more favored climes.

The chief source of roses into India was of course the fabled 'Silk Route', starting in the east from Japan and China through central Asia and entering India through the north Himalayan passes, but mainly from the western passes, particularly the Khyber Pass, near Peshawar in modern Pakistan. The Khyber Pass entry was again significant for the influx of roses from Persia. Apart from this romantic land route, there had been extensive sea trade between China, South East Asia, and the Arab countries, and India. The Chinese love for roses extended to their sailors carrying pot roses in their galleons as nostalgic reminders of home, and Indian ports, for e.g. Calicut on the west coast, would certainly have received many such plants.

One other factor that must be emphasized is the Indian tradition of not recording history, but passing on knowledge and information by word of mouth, from generation to generation - an adequate system perhaps in times of peace but hardly capable of withstanding alien rule. So it is no surprise that we have to depend largely on the travelogues of foreigners visiting India for details of roses which existed in the past, and which have now become ‘mystery roses’ without trace. Fortunately for chroniclers of Indian rose history, there are a few Indian references.

Before taking up these references we cannot resist mentioning a legend where the Hindu gods, Brahma the Creator, and Vishnu the Protector, had a debate whether the lotus or the rose was the most beautiful of flowers – and of course the rose won!

An interesting reference to roses is the mention in the ‘Kama Sutra’, the ancient treatise on the art of love, dating to the 10th century, C.E. Oddly enough, amidst a wealth of rather explicit advice, there is a chapter entitled ‘Duties of a Virtuous Wife’ and one of these is to maintain a garden with many fragrant flowers, including roses. Not a clue on what roses could have been in existence then.

An authentic Indian record of roses is the stone tablet now lodged in Sintra, Portugal which has inscribed on it an edict of a chieftain, Sarangadeva, of a part of Gujarat , dating to early 13th century. This tablet speaks of an allotment of land to the gardener’s guild, on the condition that the guild supplied the temple of Somnath 200 white roses and 2000 oleanders every day. Clearly, this mystery white rose must have been of the continuous flowering kind if the conditions of the edict were to be met. But the significant point is that such a white rose could only be of Chinese origin, pointing to the arrival of continuous flowering roses to India earlier than the 13th century.

Again in Gujarat, around the same period, the Central Asian traveler and historian, Rashiduddin, records that the people of the region ‘were very happy, and grew over 60 kinds of roses’.

In the 14th century there was great king, Krishna Deva Raya, in peninsular India, who ruled over the Vijayanagar Empire. The Portuguese traveler, Domingo Paes talks of the king being received with white roses every morning during the nine day Dasera Festival held in the month of October. This again was obviously a continuous flowering white rose, capable of flowering in October. A little later in 1503 C.E., the Italian traveler, Ludovico Varthema, refers to roses in ‘white, pink, red and yellow’ being grown by the natives of the port city of Calicut (northern part of Kerala

State, on the western coast). Efforts to trace these roses have so far been in vain. Could it be that these were roses brought by the Chinese in their ships as mentioned earlier?

The Mughal emperors of India who ruled over most of the country during the period 1500 C.E. to late 1700 were great flower enthusiasts and used their Central Asian and Afghan connections to import the musk rose as well as a form of *R. damascena* still grown in North India for extraction of rose attar. This rose is probably *R. damascena bifera*.

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Another Madurai find is a very vigorous but spreading rose, with very large flowers, full of petals, in dark pink. The blooms which quite often hang their heads, open to lovely old rose form and are borne on a very healthy bush. Typical Tea fragrance. The unvarying pink color seems to distinguish this from the widely grown ‘Mrs B.R.Cant’ which has two shades of pink. We have code-named this “Madurai Tea”.

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All these and more ‘found’ roses are described in Ducrot’s book, ‘A Garden for Roses’ (2001).

The reader can understand that there should be many more mystery roses lurking in many places in India, particularly the lower ranges of the Himalayas, and in Bengal, waiting to be found and identified by enthusiasts, who are, sadly, not visible in present times.

Apart from the location and identification of ‘mystery roses’ the heritage rose movement requires that we create new forms of the old roses – to produce roses which combine the time-tested virtues of the old with new characteristics. David Austin has pioneered this kind of work, but his roses, having been bred for the British climate, are not suited for the world’s warmer rose growing areas, which require new forms of Teas, Chinas and Noisettes, which are well adapted. To this end work has been done with *R. clinophylla, (*a close relative of *R. bracteata),* which is perhaps the world’s only tropical rose species, and the with the superior form of *R. gigantea,* found in India’s North-East. Among the new arrivals are Tea roses of the type of ‘Aussie Sixer’ and ‘Faith Whittlesey’, as well as a series of yet unreleased dwarf Tea roses (which we are calling ‘Patio Teas’) suited for container culture. Work has also progressed with *R. gigantea* to yield new climbers and shrubs adapted to warmth.

The nearness to rose species in these introductions should hopefully contribute to better adaptability and ease of culture.

This article was originally published in the 2011 book *Mystery Roses Around the World,* and is reprinted here with the permission of the Heritage Rose Foundation of USA.

Copies of the original

Indian Rose Annual 2012

Mystery Roses of India

Mrs. Girija and M.S. (Viru) Viraraghavan

If you look at the world map it is quite clear that India is well placed to have received a flood of roses from the two great centers of wild and historical roses – China, and Persia (now Iran) and the Middle East. This, together with the fact that India's social order was severely disrupted by 700 years of foreign rule makes it rather appropriate to describe the country as, with apologies to Edward Fitzgerald and Omar Khayyam, " a battered caravanserai whose alternate portals are east and west'.

It is quite fascinating to chronicle how roses reached India in so many ways but sheer numbers would have made it impossible to do justice to the subject but for the fact that most of India having an unfavorable climate for roses, resulted in rapid extinction of many of the new rose introductions arriving from more favored climes.

The chief source of roses into India was of course the fabled 'Silk Route', starting in the east from Japan and China through central Asia and entering India through the north Himalayan passes, but mainly from the western passes, particularly the Khyber Pass, near Peshawar in modern Pakistan. The Khyber Pass entry was again significant for the influx of roses from Persia. Apart from this romantic land route, there had been extensive sea trade between China, South East Asia, and the Arab countries, and India. The Chinese love for roses extended to their sailors carrying pot roses in their galleons as nostalgic reminders of home, and Indian ports, for e.g. Calicut on the west coast, would certainly have received many such plants.

One other factor that must be emphasized is the Indian tradition of not recording history, but passing on knowledge and information by word of mouth, from generation to generation— an adequate system perhaps in times of peace but hardly capable of withstanding alien rule. So it is no surprise that we have to depend largely on the travelogues of

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'Hillview', Fernhill Road, Kodaikanal 624 101. Tamil Nadu foreigners visiting India for details of roses which existed in the past, and which have now become 'mystery roses' without trace. Fortunately for chroniclers of Indian rose history there are a few Indian references.

Before taking up these references we cannot resist mentioning a legend where the Hindu gods, Brahma the Creator, and Vishnu the Protector, had a debate whether the lotus or the rose was the most beautiful of flowers – and of course the rose won!

An interesting reference to roses is the mention in the 'Kama Sutra', the ancient treatise on the art of love, dating to the 10th century, C.E. Oddly enough, amidst a wealth of rather explicit advice, there is a chapter entitled 'Duties of a Virtuous Wife' and one of these is to maintain a garden with many fragrant flowers, including roses. Not a clue on what roses could have been in existence then.

An authentic Indian record of roses is the stone tablet now lodged in Sintra, Portugal which has inscribed on it an edict of a chieftain, Sarangadeva, of a part of Gujarat , dating to early 13th century. This tablet speaks of an allotment of land to the gardener's guild, on the condition that the guild supplied the temple of Somnath 200 white roses and 2000 oleanders every day. Clearly, this mystery white rose must have been of the continuous flowering kind if the conditions of the edict were to be met. But the significant point is that such a white rose could only be of Chinese origin, pointing to the arrival of continuous flowering roses to India earlier than the 13th century.

Again in Gujarat, around the same period, the Central Asian traveler and historian, Rashiduddin, records that the people of the region 'were very happy, and grew over 60 kinds of roses'.

In the 14th century there was a great king, Krishna Deva Raya, in peninsular India, who ruled over the Vijayanagar Empire. The Portuguese traveler, Domingo Paes talks of the king being received with white roses every morning during the nine day Dasera Festival held in the month of October. This again was obviously a continuous flowering white rose, capable of flowering in October.

A little later in 1503 C.E., the Italian traveler, Ludovico Varthema, refers to roses in 'white, pink, red and yellow' being grown by the natives of the port city of Calicut (northern part of Kerala State, on the western coast). Efforts to trace these roses have so far been in vain. Could it be that these were roses brought by the Chinese in their ships as mentioned earlier?

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The four Stud Chinas, among many others, must have passed through like this. But there is a curious observation in the book 'The Book of Roses- A Rose Fancier's Manual ' by Mrs. Gore, 1847, (alleged to be an English replica of Pierre Boitard's 'Manual Complet de l'amateur des roses') where she describes the tigers and crocodiles of Bengal lurking under giant red rose bushes of *Rosa semperflorens* alias 'Slater's Crimson China'. 'Slater's Crimson China' could probably have reached India by then, but looking at what is now grown as this rose in Calcutta, one wonders whether such a moderate growing plant could camouflage a tiger or a crocodile.

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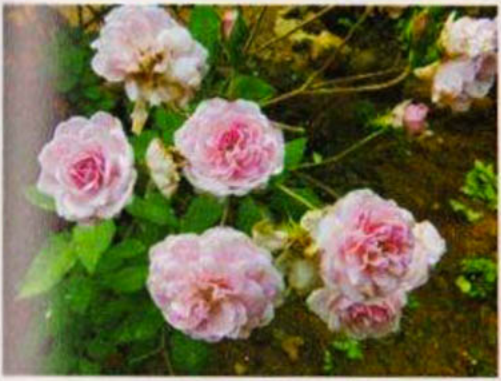

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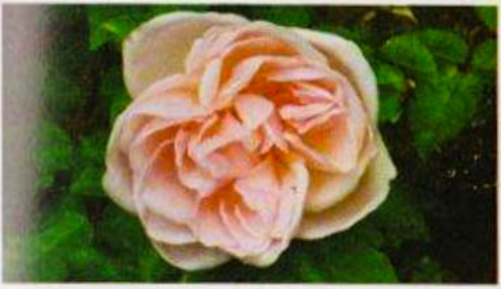

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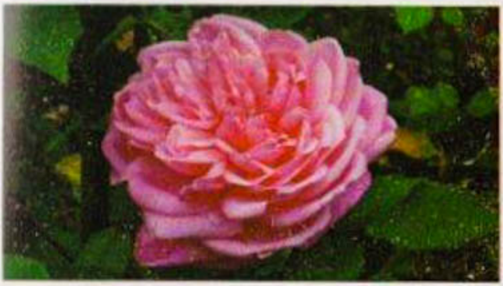

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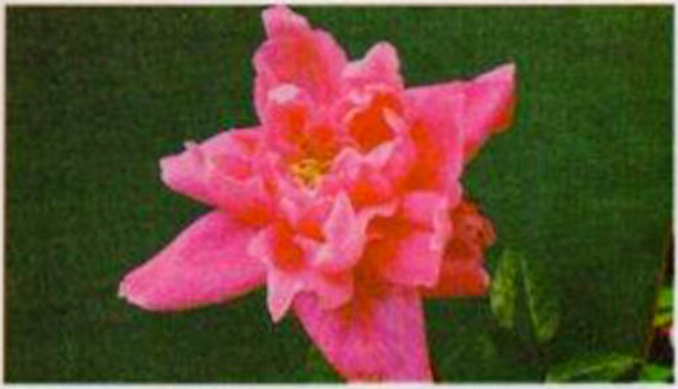
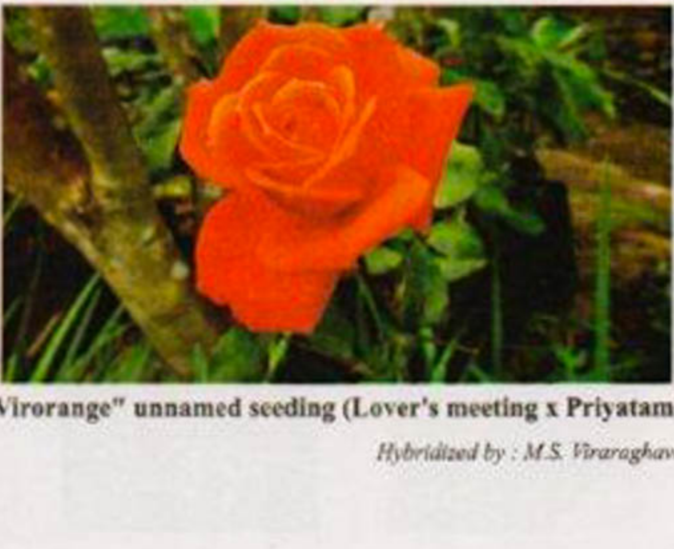


Ganges Nymph - a *R.clinophylla* hybrid



"Virorange" unnamed seeding (Lover's meeting x Priyatama)

Hybridized by : M.S. Viraraghavan

Indian Rose Annual - IRA 2013

Sustainable Rose Growing - An Indian Dream

M.S. Viraraghavan

The subject of dreams has been in the forefront of Japanese imagination ever since the world renowned series of movies, one of which was called ‘Dreams’ was launched by the award winning film director Akira Kurasawa. Perhaps it is this influence which led to my good friend Katsuhiko Maebara naming that part of the Sakura Rose Garden, which is planted with some of my roses as ‘Dreams of India Garden’. A compliment that I greatly cherish.

Rose breeders are indeed dreamers, a fact recognized by that doyen of American rose breeders, H.C. Swim. As you know, Swim’s roses regularly won the All American Rose Selections in the heyday of the Hybrid Teas. Pragmatic as he was, Swim titled his book on rose breeding ‘Roses – From Dreams to Reality’.

Striking a personal note, I have always been fascinated by roses which are different. India’s well known rose breeder, Dr. B.P. Pal, has written about me, half in jest, that while other hybridizers preferred a safer ‘bird in hand’ policy, I appeared to have agreed with Bret Harte, who wrote ‘a bird in hand is a certainty, but a bird in the bush may sing!’. But don’t be afraid, I am not going to sing about my roses but merely narrate where my dreams of roses have led me so far.

I began rose breeding in the early 1960’s with the inspiration provided by Mr. B.S. Bhatcharji who emphasized the need to have a separate line of breeding for warm climates. In other words, produce sustainable roses. So however eccentric the choice of objective the roses which emerged had to be easy to grow.

From the outset the emphasis was on roses which are not martyrs to fungus problems requiring spraying with modern fungicides, many of which are environmentally hazardous. The seedlings raised under my programme are sprayed only with a mixture of potassium bicarbonate and neem oil, to control disease, adapting the pioneering work done in the Montreal Botanic Garden. Even this environment friendly spray schedule is not rigidly followed, but only occasional sprays given depending on weather conditions.

Inspired by Mr. Bhatcharji, one of my earliest dreams was to produce Tea roses in brighter colors. Several crosses were made with the yellow Tea, ‘Etoile de Lyon’, and an unknown pink Tea, crossing them into modern Hybrid Teas, and one, the pink Tea x 'Samba', produced my first rose, named, rather aptly I feel, ‘First Offering’, a bushy plant with lovely red flowers of the Tea rose persuasion, but sadly now lost. I remember two other seedlings, a dazzling yellow variety from the pink Tea into the Le Grice floribunda, ‘Gold Gleam’, and a salmon from ‘Etoile de Lyon’ x ‘Mischief' – these too were lost when I wakened from rose reveries to the realities of career in Government service, which entail constant transfers from one place to another.

Somewhat later started an obsession, I must confess with the so-called ‘hand-painted’ roses, originated by Sam McGredy. Having been always very fond of bicolor roses, I was captivated by his first hand painted floribunda, ‘Picasso’, where the colors of red and white are mixed at random. The dream was to produce a Hybrid Tea with the same mix of colors. It so happened that my very first effort resulted in success. ‘Picasso’ crossed into the red and white ‘Inge Horstmann’ produced ‘Priyatama’, named for Girija. “Priyatama” means “most beloved” in Sanskrit.

Many other hand-painted roses followed like 'Bodhisattva' ('Magic East') and 'Blushing Yuki'.

I have been attracted to roses in unusual colors, so it comes as no surprise that my attention was drawn to what are optimistically called ‘blue roses’. Working with the heritage Geschwind rose, ‘Gruss an Teplitz’, which does well in India, brought ‘Vanamali’, which grows in the Sakura garden. Many others followed including some in the closely related brownish colors, like ’Coffee Country’.

The great rose breeder, Edward Le Grice was an inspiration and his roses, ‘Lilac Charm’, ‘Amberlight’ and ‘Tom Brown’, in shades of brown, and ‘Ripples’, lilac, as well as the incredible purple, ‘News’, which owes its color to the Gallica, ‘Tuscany’, became part of my breeding line, which is now focused on the purple shades so loved in India.

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The diploid range received an unexpected boost when crosses were made with the Noisette climber, 'Rêve d'Or', which does well in India. For some unaccounted reason, the seedlings were all very dwarf but quite bushy and I nicknamed them after a leading Indian politician who was so short that some wag referred to him as being below sea level!.

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Basically the Hybrid Tea is evolved from the cross of Tea roses with Hybrid Perpetuals. Harkness points out that the Hybrid Perpetual has practically no chinensis genes in its genetic makeup, except the gene for repeat flowering.

If we want a better Hybrid Tea for warm climates why not substitute the Hybrid Perpetual with another large flowered rose, where the chinensis genes are more prominent?

Pursuing this dream a new line of Hybrid Teas starting from Alister Clark’s ‘Lady Mann’ was begun.

Apart from heat resistance the emphasis from the beginning in these new lines was on evergreen foliage based on the simple logic that a rose plant, especially in the tropics and subtropics, should look beautiful even when not in bloom, as roses have to compete with the lush foliage of other warm climate plants. The dream was that the new varieties would fill the existing gap in roses suitable for these areas. In addition efforts are on to produce brighter colors by bringing in the genes of ‘Fortune’s Double Yellow’ and some of the brighter colored miniature roses.

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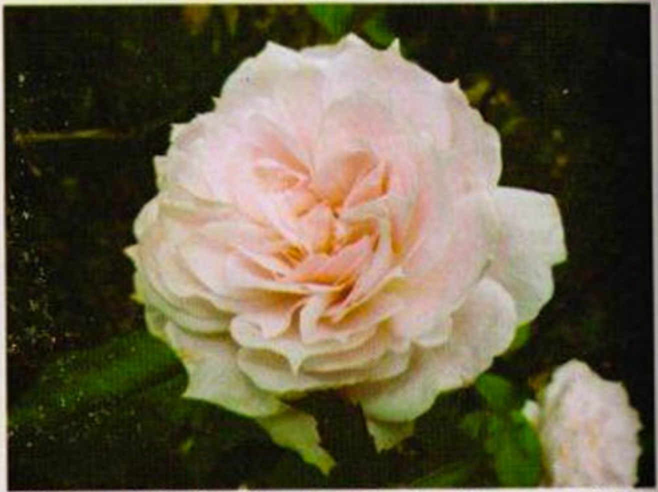
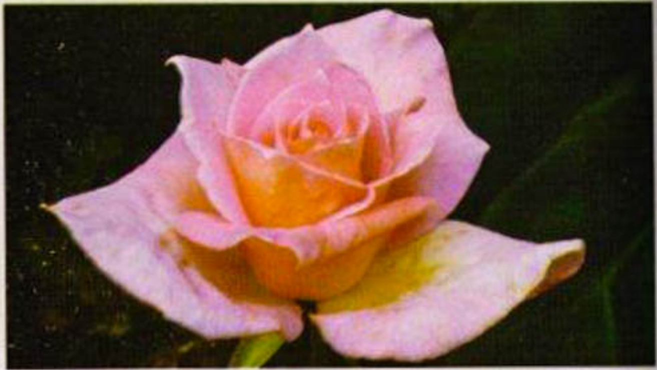


'Allegory of Spring' (Carefree Beauty x Evergreen Gene)

M.S. Viraraghavan



'Dr.N.C.Sen'
(Naga Belle x Lady Mann) x Winter Sunset

M.S. Viraraghavan

Sustainable Rose Growing--- An Indian Dream

M.S.Viraraghavan

The subject of dreams has been in the forefront of Japanese imagination ever since the world renowned series of movies, one of which was called 'Dreams' was launched by the award winning film director Akira Kurasawa . Perhaps it is this influence which led to my good friend Katsuhiko Maebara naming that part of the Sakura Rose Garden, which is planted with some of my roses as 'Dreams of India Garden'. A compliment that I greatly cherish.

Rose breeders are indeed dreamers, a fact recognized by that doyen of American rose breeders, H.C. Swim. As you know, Swim's roses regularly won the All American Rose Selections in the heyday of the Hybrid Teas. Pragmatic as he was, Swim titled his book on rose breeding 'Roses – From Dreams to Reality'.

Striking a personal note, I have always been fascinated by roses which are different. India 's well known rose breeder, Dr. B.P.Pal, has written about me, half in jest, that while other hybridizers preferred a safer 'bird in hand' policy, I appeared to have agreed with Bret Harte, who wrote 'a bird in hand is a certainty, but a bird in the bush may sing!'. But don't be afraid, I am not going to sing about my roses but merely narrate where my dreams of roses have led me so far.

I began rose breeding in the early 1960's with the inspiration provided by Mr. B.S.Bhatcharji who emphasized the need to have a separate line of breeding for warm climates. In other words, produce sustainable roses. So however eccentric the choice of objective, the roses which emerged had to be easy to grow.

From the outset the emphasis was on roses which are not martyrs to fungus problems requiring spraying with modern fungicides, many of which are environmentally hazardous. The seedlings raised under my programme are sprayed only with a mixture of potassium bicarbonate

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and neem oil, to control disease, adapting the pioneering work done in the Montreal Botanic Garden . Even this environment friendly spray schedule is not rigidly followed, but only occasional sprays given depending on weather conditions.

Inspired by Mr. Bhatcharji, one of my earliest dreams was to produce Tea roses in brighter colors. Several crosses were made with the yellow Tea, 'Etoile de Lyon', and an unknown pink Tea, crossing them into modern Hybrid Teas, and one, the pink Tea x Samba, produced my first rose, named, rather aptly I feel, 'First Offering' , a bushy plant with lovely red flowers of the Tea rose persuasion, but sadly now lost. I remember two other seedlings, a dazzling yellow variety from the pink Tea into the le Grice floribunda, 'Gold Gleam', and a salmon from 'Etoile de Lyon' x 'Mischief – these too were lost when I wakened from rose reveries to the realities of a career in Government service, which entail constant transfers from one place to another.

Somewhat later started an obsession, I must confess, with the so-called 'hand-painted' roses, originated by Sam McGredy. Having been always very fond of bicolor roses, I was captivated by his first hand painted floribunda, 'Picasso' , where the colors of red and white are mixed at random. The dream was to produce a Hybrid Tea with the same mix of colórs. It so happened that my very first effort resulted in success. 'Picasso' crossed into the red and white 'Inge Horstman' produced 'Priyatama', named for Girija. "Priyatama' means 'most beloved' in Sanskrit.

Many other hand-painted roses followed like Bodhisatwa (Magic East) and Blushing Yuki.

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Indian Rose Annual - IRA 2014

Roses in many lands

Girija and M.S.Viraraghavan

In the summer of 2013, we were fortunate to visit many rose gardens and meet old rose friends in Europe, the USA and Scotland.

Our first port of call was the exotic rose nursery, Roseraie du Desert, run by our friends Becky and John Hook. Their garden is located in southern France, quite near the city of Toulouse, famous for its Airbus industry. The Hooks are specialists in Tea roses and their close relatives—perhaps their collection is the most comprehensive in the entire world, and well worth a visit by Indian rose lovers, since the Teas do so well for us. Many of the old stalwarts – Mrs. B.R.Cant, Lady Hillingdon, Madame Falcot which are so common in India were grown to perfection, with a supporting cast of lovely climbing Teas. We saw old favourites like Marechal Niel and Lamarque, as well as some unfamiliar ones, including Souvenir d' Alphonse Lavallee, a climbing Hybrid Perpetual with exquisite large flowers of the darkest red with a hint of purple. Many of our roses were also to be seen including the Teas, Faith Whittlesey, Krishna's Peach, Padmasambhava (Lotus Born), New Blush and the hybrid gigantea, Sir Henry Collett, named for the discoverer of the species *R.gigantea* in Upper Burma. John has himself constructed the huge wide wooden pergolas on the rose terraces, and they added greatly to the overall enchantment of the garden.

From France we traveled to Portugal, to the World Heritage city of Sintra, near Lisbon. The purpose of our visit was two-fold – to see the unique rose garden and architectural splendour of Monserrate, a charmingly restored palace and garden, which has strong Indian connections, as well as Penha Verde, another heritage property, where we hoped to view an ancient stone pillar dating to 1297 C.E., which has a Sanskrit inscription relating to roses. This pillar was originally part of the Somnath temple in Gujarat, now submerged under the sea.

The gardens of Monserrate represent an unique collection of sub-tropical flora, where many roses, which would require greenhouse protection in Europe, thrive exuberantly in the open. Planted on a grand scale, in a sheltered area, just below the Great Lawn, are roses of the China, Tea and Noisette types so well known to our older rosarians. Of great personal interest was the collection of gigantea hybrids, planted for sentimental reasons, as the first gigantea hybrid Belle Portugaise was bred by Henri Cayeux in 1903 at the Lisbon Botanical Garden. Our friend, the landscape architect Gerald Luckhurst, had planted some of our own Indian hybrids of *R.gigantea*, including Manipur Magic, Golden Threshold, Amber Cloud, Sir George Watt and many others, as modern examples of the same strain. An unique feature of the planting is the way in which these roses are allowed to reach their full potential – each variety covering well over 100 sq.ft!!

From Monserrate we went to Penha Verde, whose garden hosts the two stone pillars from Somnath, (we had thought there was just one stone tablet) positioned on either side of steps leading to a chapel, with breath-taking views of the valley beyond. The Sanskrit inscription engraved on the pillars, translated by no less a person than Dr. K. M. Munshi in his book "Somanatha, the Shrine Eternal", speaks of the gardener's guild in Somnath being allotted land on the condition that it supplied 200 white roses and 2000 white oleanders everyday to the temple.

From the point of view of Indian rose history this inscription is very significant indeed. Clearly, white roses which flowered throughout the year could only have reached India from China (from where continuous flowering roses evolved).Since the inscription dates to 1297 C.E., roses from China must have reached India substantially earlier. One speculates that Gujarat being near the Indian end of the fabled Silk Route, (connecting China through Central Asia to India, and Europe) roses could have reached along with traders.. Another possibility is that Chinese ships calling at the great port of Surat on the Gujarat coast could have been the source of these new roses.(A fascinating account of how, for nostalgic reasons, Chinese sailors carried roses in pots , is available in Peter Valder's book " Garden Plants of China").

From Sintra we retraced our steps to London where we saw the Great Conservatory in Kew Gardens (it was too early for roses) before leaving for the U.S., to Louisville, Kentucky, and our son's home. While there, we made two trips to Florida and neighbouring states, in search of warm climate roses. On our first visit we saw several enchanting gardens including the world famous Fairchild Tropical Botanical Garden and the exquisitely landscaped Murakami Japanese Garden, in Miami. But there were no roses in either garden, though there was plenty else to admire, like unbelievably exotic gardenias and rare trees.

Our next trip to Florida started from Washington D.C., where we visited Hillside Garden in Montgomery County, Maryland, which has a sunken garden planted with a stunning collection of modern roses, including many All America Rose Selections, which do so well for us. But the highlight was, surprisingly, a glorious bush of that wonderful David Austin English rose, Graham Thomas, covered in golden yellow blooms as well as the exuberant profusion of white climbing hydrangeas.on the ancient trees.

Meanwhile our rose friend Gene Waering had arrived, as we had planned a road trip to Florida seeing many rose gardens en route. We first drove to the charming university town of Asheville, North Carolina, where the well known Biltmore House and Garden are located. Belonging to the wealthy Vanderbilt family, the garden which covers several hundred acres, has a breathtaking collection of ornamental trees and plants. But we were focused on the newly started Rose Trial Ground, and its surrounding rose garden. The trial area which is meticulously maintained by Paul Zimmerman, features a host of entries from leading rose growers of the world. But the Gold Medal winner this year was a white climbing rose from an amateur, Bill Athy of New Zealand (see Paul Zimmerman's article in this rose annual) which testifies to the fairness of the trial. In fact special care is taken to ensure that amateur raised roses are provided with a level playing field, to compete on equal terms with the professionals.

At Asheville we were delighted to see a plant of our Bodhisattwa (Magic East) in bloom in the garden of our hosts, Chris and Rick Manheim.

The next day we visited the well known rose nursery, Roses Unlimited, in Laurel, South Carolina., owned by distinguished rose growers and our friends Pat Henry and Bill Paterson who had given us a tremendous boost by introducing some of our roses in the US. We saw the beautifully maintained grounds and roses in Pat's home. Spectacular potted specimens of our roses, Faith Whittlesey, Krishna's Peach, and Emina, all grown to gigantic proportions, were a source of great encouragement. Rose Unlimited specializes in growing roses on their own roots and the standard of the plants has to be seen to be believed, dispelling notions that roses can only be grown as budded plants.

Our next visit was to see the botanic garden in Orangeburg, southern South Carolina State, but en route we spent a very informative half day in the Magnolian Grove Arboretum of Dick and Anita Figlar. The Figlars are world authorities on the genus magnolia and their garden, charmingly located in the foothills of the Blue Ridge Mountains, features extensive plantings of an amazing range of magnolias, including several of the newly introduced evergreen species from South Asia.

The Edisto Memorial Garden in Orangeburg ('memorial' because it is dedicated to the soldiers of the state who had died in various wars) has a large formal rose garden planted with a host of modern varieties as well as a separate area housing a collection of heritage roses, mainly Noisettes. The spectacular appearance of the garden testifies to the careful upkeep, which is scenically situated on the bank of the 'black river', called Edisto. Tall trees, many of the southern U.S. magnolia, *M. grandiflora*, add to the overall effect.

At Edisto we were joined by our friend Pat Shanley, Vice President of the American Rose Society. Pat and Gene were pioneering the establishment of a comprehensive collection of rose species in Edisto and we were privileged to be part of the discussions with Jay Hiers, Superintendent of Parks. If all goes well, a new species rose garden will soon be a reality.

From Orangeburg to Jacksonville, Florida, and the Orange Park Club Continental hotel, scenically located in a heritage building with an amazing view of the river, where our talk and power-point presentation on Sustainable Roses was well received by the local society members. The emphasis of the talk on evolving better roses for warm climates was welcomed by the Florida rosarians who have long struggled with modern roses bred for cold climates.

Driving southwards our next stop was at the Leu Gardens in Orlando, where we met the Historic Roses Group of the Orlando Rose Society. The heritage rose garden was planted with many warm weather roses, the Chinas and Teas. Mrs. B.R. Cant, Celine Forestier, Old Blush and Nur Mahal, hybrid musk, were in splendid bloom.

Then further south to Boynton Beach to meet Ambassador Faith Whittlesey, after whom we had named a Tea rose. This long overdue visit was a delightful interlude with the Ambassador at her charming best, making us feel very welcome.

We also visited the nearby Cool Roses nursery owned by Geoff and Deb Coolidge. Geoff has mastered the art of budding roses on R. fortuniana rootstock, which is so suitable for Florida and similar climates.

The final part of our Florida sojourn was to the campus of Florida Southern College in Lakeland. Romantically landscaped with buildings designed by no less an architect than the legendary Frank Lloyd Wright, Lakeland is the site for an ambitious new rose garden on the college premises, designed by the well known rose personality who is attached to the college department of horticulture, Dr Malcolm Manners, in close association with Stephen Scanniello, President of the Heritage Rose Foundation, USA. We first had a rapid tour of the rose plantings and collection of Bermuda and other warm weather roses in the college greenhouses. A glorious fragrant bed of the found rose, the Hybrid Perpetual 'Maggie' was a stunning sight, perhaps the same rose as our own red garland rose Kakinada Red; as also a planting of Mrs. B.R. Cant. The new rose garden will be located on a slight slope with the rose beds in a vast semi-circle. During our visit we could see just the layout but as we write (November) the planting of over 300 roses has been completed, including several Viru roses.

Then began the journey home, the first leg of which was from USA to Scotland. In the background of this visit was our hybrid gigantea rose, 'Sir George Watt', named in honour of the discoverer of the species gigantea in the mountains of Manipur State in 1882. Sir George Watt was one of the most distinguished ‘renaissance’ men of his times, with a matchless contribution not only in botany but also in education, art and science. One of his greatest accomplishments was the monumental 9 volume Dictionary of Economic Products of India, written as far back as 1906, but still a standard work of reference.

After our successful trip in 1990 to the same area where Watt collected *R.gigantea,* we had named a rose for him. With the help of Mr. Kasturirangan of KSG Sons, we had successfully sent a plant to be grown in the Logan Botanic Garden in south-west Scotland, very near the area where Sir George had lived after his return from India.

As a prelude to our present visit we had established contact with several of his descendants and family friends, as well as with Morag Williams, the archivist at the Royal Crichton Hospital where he had worked. It was arranged for us all to meet and drive to Logan to see the rose planted there by Curator Richard Baines. It was an inspiring moment to see it climbing over 15 feet high on the enclosed garden brick wall, looking perfectly at home. Sadly not in bloom- apparently it flowers only in late August.

Another connection with Scotland was the rose ‘Benares Dawn’, bred in Dehra Dun by Major Saksena in the 1970’s. Along with the plant of Sir George Watt, Mr. Kasturirangan had sent two plants of Benares Dawn to Major Saksena’s daughter, Ruhi Thallon (who has settled in Scotland). Originally Ruhi had contacted us in India and we had helped in locating this variety with Mr. Kasturirangan. It was a pleasure to see the buds of this lovely apricot rose, nicely established in its new home. (see article “ ‘Sir George Watt’ accompanies ‘Benares Dawn’ to Scotland” in the 2011 Indian Rose annual)

The final part of our rose wanderings was a visit, along with Ruhi, to the well known Toll Cross Park in Glasgow. The beautifully maintained rose beds were in full bloom. Toll Cross Park is also recognized for its rose trials, which are judged by an international jury.

Our last stop was the Queen Mary’s Rose Garden in Regents Park, London, where the Millar Gault designed caternaries for climbing roses and rose beds leading to a little lake, make for a gem of a garden. We were delighted to see a glorious bed of that old stalwart, Diamond Jubilee, in tremendous form.

Thus ended our travels in search of roses but the memories will stay with us.

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From France we traveled to Portugal, to the World Heritage city of Sintra, near Lisbon. The purpose of our visit was two-fold – to see the unique rose garden and architectural splendour of Monserrate, a charmingly restored palace and garden, which has strong Indian connections, as well as Penha Verde, another heritage property, where we hoped to view an ancient stone pillar dating to 1297 C.E., which has a Sanskrit inscription relating to roses. This pillar was originally part of the Somnath temple in Gujarat, now submerged under the sea.

"Hillview" Fern Hill Road, Kodaikanal 624 101 Tamilnadu

The gardens of Monserrate represent an unique collection of sub-tropical flora, where many roses, which would require greenhouse protection in Europe, thrive exuberantly in the open. Planted on a grand scale, in a sheltered area, just below the Great Lawn, are roses of the China, Tea and Noisette types so well known to our older rosarians. Of great personal interest was the collection of gigantea hybrids, planted for sentimental reasons, as the first gigantea hybrid Belle Portugaise was bred by Henri Cayeux in 1903 at the Lisbon Botanical Garden. Our friend, the landscape architect Gerald Luckhurst, had planted some of our own Indian hybrids of *R.gigantea*, including Manipur Magic, Golden Threshold, Amber Cloud, Sir George Watt and many others, as modern examples of the same strain. An unique feature of the planting is the way in which these roses are allowed to reach their full potential – each variety covering well over 100 sq.ft!!

From Monserrate we went to Penha Verde, whose garden hosts the two stone pillars from Somnath, (we had thought there was just one stone tablet) positioned on either side of steps leading to a chapel, with breath-taking views of the valley beyond. The Sanskrit inscription engraved on the pillars called the Cintra Prashasti, translated by no less a person than Dr. K. M. Munshi in his book "Somanatha, the Shrine Eternal", speaks of the gardener's guild in Somnath being allotted land on the condition that it supplied 200 white roses and 2000 white oleanders every day to the temple.

From the point of view of Indian rose history this inscription is very significant indeed. Clearly, white roses which flowered throughout the year could only have reached India from China (from where continuous flowering roses evolved).Since the inscription dates to 1297 C.E., roses from China must have reached India substantially earlier. One speculates that Gujarat being near the Indian end of the fabled Silk Route, (connecting China through Central Asia to India, and Europe) roses could have reached along with traders. Another possibility is that Chinese ships calling at the great port of Surat on the Gujarat coast could have been the source of these new roses.(A fascinating account of how, for nostalgic reasons, Chinese sailors carried roses in pots , is available in Peter Valder's book " Garden Plants of China").

From Sintra we retraced our steps to London where we saw the Great Conservatory in Kew Gardens (it was too early for roses) before leaving for the U.S., to Louisville, Kentucky, and our son's home. While there, we made two trips to Florida and neighbouring states, in search of warm climate roses. On our first visit we saw several enchanting gardens including the world famous Fairchild Tropical Botanical Garden and the exquisitely landscaped Murakami Japanese Garden, in Miami. But there were no roses in either garden, though there was plenty else to admire, like unbelievably exotic gardenias and rare trees.

Our next trip to Florida started from Washington D.C., where we visited Hillside Garden in Montgomery County, Maryland, which has a sunken garden planted with a stunning collection of modern roses, including many All America Rose Selections, which do so well for us. But the highlight was, surprisingly, a glorious bush of that wonderful David Austin English rose, Graham Thomas, covered in golden yellow blooms as well as the exuberant profusion of white climbing hydrangeas.on the ancient trees.

Meanwhile our rose friend Gene Waering had arrived, as we had planned a road trip to Florida seeing many rose gardens en route. We first drove to the charming university town of Asheville, North Carolina, where the well known Biltmore House and Garden are located. Belonging to the wealthy Vanderbilt family, the garden which covers several hundred acres, has a breathtaking collection of ornamental trees and plants. But we were focused on the newly started Rose Trial Ground, and its surrounding rose garden. The trial area which is meticulously maintained by Paul Zimmerman, features a host of entries from leading rose growers of the world. But the Gold Medal winner this year was a white climbing rose from an amateur, Bill Athy of New Zealand (see Paul Zimmerman's article in this rose annual) which testifies to the fairness of the trial. In fact special care is taken to ensure that amateur raised roses are provided with a level playing field, to compete on equal terms with the professionals.

At Asheville we were delighted to see a plant of our Bodhisattwa (Magic East) in bloom in the garden of our hosts, Chris and Rick Manheim.

The next day we visited the well known rose nursery, Roses Unlimited, in Laurel, South Carolina., owned by distinguished rose growers and our friends Pat Henry and Bill Paterson. Roses Unlimited had given us a tremendous boost by introducing some of our roses in the US. We saw the beautifully maintained grounds and roses in Pat's home. Spectacular potted specimens of our roses, Faith Whittlesey, Krishna's Peach, and Emina, all grown to gigantic proportions, were a source of great encouragement. Roses Unlimited specializes in growing roses on their own roots and the standard of the plants has to be seen to be believed, dispelling notions that roses can only be grown as budded plants.

Our next visit was to see the botanic garden in Orangeburg, southern South Carolina State, but en route we spent a very informative half day in the Magnolian Grove Arboretum of Dick and Anita Figlar. The Figlars are world authorities on the genus magnolia and their garden, charmingly located in the foothills of the Blue Ridge Mountains, features extensive plantings of an amazing range of magnolias, including several of the newly introduced evergreen species from South Asia.

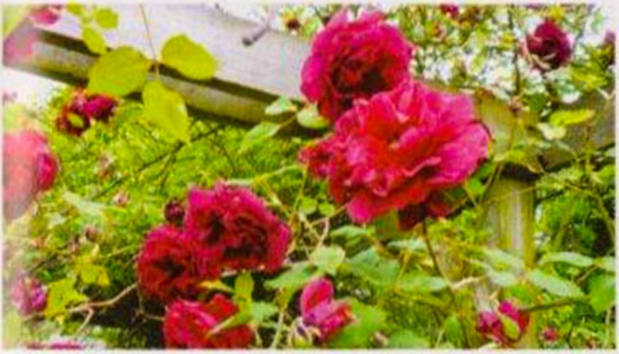
The Edisto Memorial Garden in Orangeburg ('memorial' because it is dedicated to the soldiers of the state who had died in various wars) has a large formal rose garden planted with a host of modern varieties as well as a separate area housing a collection of heritage roses, mainly Noisettes. The spectacular appearance of the garden testifies to the careful upkeep, which is scenically situated on the bank of the 'black river', called Edisto. Tall trees, many of the southern U.S. magnolia, *M. grandiflora*, add to the overall effect.

At Edisto we were joined by our friend Pat Shanley, Vice President of the American Rose Society. Pat and Gene were pioneering the establishment of a comprehensive collection of rose species in Edisto and we were privileged to be part of the discussions with Jay Hiers, Superintendent of Parks. If all goes well, a new species rose garden will soon be a reality.

From Orangeburg to Jacksonville, Florida, and the Orange Park Club Continental hotel, scenically located in a heritage building with an amazing view of the river, where our talk and power-point presentation on Sustainable Roses was well received by the local society members. The emphasis of the talk on evolving better roses for warm climates was welcomed by the Florida rosarians who have long struggled with modern roses bred for cold climates.

Driving southwards our next stop was at the Leu Gardens in Orlando, where we met the Historic Roses Group of the Orlando Rose Society. The heritage rose garden was planted with many warm weather roses, the Chinas and Teas. Mrs. B.R. Cant, Celine Forestier, Old Blush and Nur Mahal, hybrid musk, were in splendid bloom.

John Hook's pergola



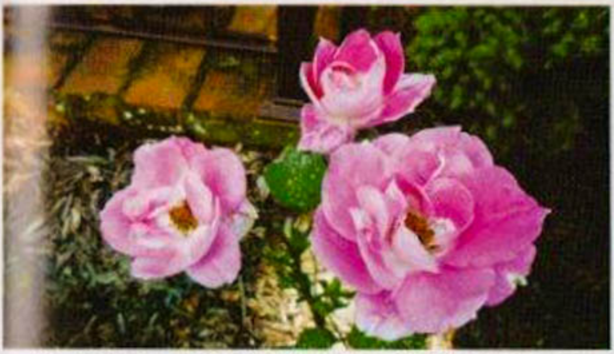
Souvenir d' Alphonse Lavallee

Monserrate, Sintra

'Sir George Watt' Rose in Monserrate

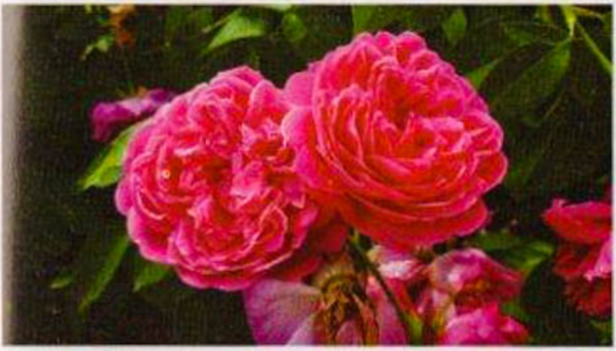
Somnath Pillars at Penha Verde, Sintra, Portugal

Sanskrit inscription in the 'Cintra Prashasti'
at Penha Verde



Bodhisattva (Magic East) in Asheville garden

Biltmore rose garden



'Maggie' (our 'Kakinada Red')
in Florida Southern College garden

At Logan Garden,' Sir George Watt' rose on brick wall behind, his family with us in front

Toll Cross Park , Glasgow trial ground

Queen Mary's Rose Garden, Regents Park, London

Then further south to Boynton Beach to meet Ambassador Faith Whittlesey, after whom we had named a Tea rose. This long overdue visit was a delightful interlude with the Ambassador at her charming best, making us feel very welcome.

We also visited the nearby Cool Roses nursery owned by Geoff and Deb Coolidge. Geoff has mastered the art of budding roses on *R. fortuniana* rootstock, which is so suitable for Florida and similar climates.

The final part of our Florida sojourn was to the campus of Florida Southern College in Lakeland. Romantically landscaped with buildings designed by no less an architect than the legendary Frank Lloyd Wright, Lakeland is the site for an ambitious new rose garden on the college premises, designed by the well known rose personality who is attached to the college department of horticulture, Dr Malcolm Manners, in close association with Stephen Scanniello, President of the Heritage Rose Foundation, USA. We first had a rapid tour of the rose plantings and collection of Bermuda and other warm weather roses in the college greenhouses. A glorious fragrant bed of the found rose, the Hybrid Perpetual 'Maggie' was a stunning sight, perhaps the same rose as our own red garland rose Kakinada Red; as also a planting of Mrs. B.R. Cant. The new rose garden will be located on a slight slope with the rose beds in a vast semi-circle. During our visit we could see just the layout but as we write (November) the planting of over 300 roses has been completed, including several Viru roses.

Then began the journey home, the first leg of which was from USA to Scotland. In the background of this visit was our hybrid gigantea rose, 'Sir George Watt', named in honour of the discoverer of the species gigantea in the mountains of Manipur State in 1882. Sir George Watt was one of the most distinguished 'renaissance' men of his times, with a matchless contribution not only in botany but also in education, art and science. One of his greatest accomplishments was the monumental 9 volume Dictionary of Economic Products of India, written as far back as 1906, but still a standard work of reference.

After our successful trip in 1990 to the same area where Watt collected *R.gigantea*, we had named a rose for him. With the help of Mr. Kasturirangan of KSG Sons, we had successfully sent a plant to be grown in the Logan Botanic Garden in south-west Scotland, very near the area where Sir George had lived after his return from India.

As a prelude to our present visit we had established contact with several of his descendants and family friends, as well as with Morag Williams, the archivist at the Royal Crichton Hospital where he had worked. It was arranged for us all to meet and drive to Logan to see the rose planted there by Curator Richard Baines. It was an inspiring moment to see it climbing over 15 feet high on the enclosed garden brick wall, looking perfectly at home. Sadly not in bloom- apparently it flowers only in late August.

Another connection with Scotland was the rose 'Benares Dawn', bred in Dehra Dun by Major Saksena in the 1970's. Along with the plant of Sir George Watt, Mr. Kasturirangan had sent two plants of Benares Dawn to Major Saksena's daughter, Ruhi Thallon (who has settled in Scotland). Originally Ruhi had contacted us in India and we had helped in locating this variety with Mr. Kasturirangan. It was a pleasure to see the buds of this lovely apricot rose, nicely established in its new home. (see article " 'Sir George Watt' accompanies 'Benares Dawn' to Scotland" in the 2011 Indian Rose annual)

The final part of our rose wanderings was a visit, along with Ruhi, to the well known Toll Cross Park in Glasgow. The beautifully maintained rose beds were in full bloom. Toll Cross Park is also recognized for its rose trials, which are judged by an international jury.

Our last stop was the Queen Mary's Rose Garden in Regents Park, London, where the Millar Gault designed caternaries for climbing roses and rose beds leading to a little lake, make for a gem of a garden. We were delighted to see a glorious bed of that old stalwart, Diamond Jubilee, in tremendous form.

Thus ended our travels in search of roses but the memories will stay with us.

Indian Rose Annual - IRA 2015

Sustainable rose breeding / growing for tropical Asia – some possibilities

An Editorial Overview

Girija and M. S. Viraraghavan

In this write-up, we present in outline, some of the interesting possibilities in rose breeding / growing, utilizing the relatively less known heritage roses / species of this area.

The ideas are arranged country-wise.

Before taking up these details country-wise it is appropriate to refer to two very important presentations at the conference which deal with the overall situation regarding wild and heritage roses in our region.

The first by Dr William McNamara, deals with the numerous expeditions he has undertaken to collect the rose species in Asia and cultivate them in the Quarry Hill Botanic Garden in California. We are fortunate that this first hand information on collection and ex situ conservation is being presented by the explorer, who has undertaken this tremendous task.

Another presentation of equal importance, by Mr. Robert Mattock, deals with the role of the Silk Road which traverses our region in the movement and distribution of rose species as well as heritage roses in Asia and Europe. The role of enthusiasts in the conservation and creation of rose hybrids all along this route is emphasized in this path breaking write-up. We understand that the earlier emphasis on heritage roses traveling by the sea route from Asia to Europe gives only one part of the process of distribution of roses. The Silk Road has been equally, if not more significant, in this process.

We now take up the country wise distribution with an emphasis on relatively less known heritage roses / species.

JAPAN : Like many other islands, Japan exhibits some very distinctive roses which fit into our theme. One of the most interesting is the pink and white variegated form of *R. laevigata*, called ‘laevigata rosea’, which is not uncommon in that country. This is a very striking rose with lovely blends of color - perhaps surpassing the well known *R. laevigata* hybrid, ‘Anemone’, in the same color blend. Fortunately, the rather depressing observation of Gerd Krussman in his ‘Complete

Book of Roses' (1974) that no work has been done with this rose should not be a deterrent, as at least one distinctive seedling has been raised from it by me (codename 'Virrosea') (see photograph).

Another interesting possibility is the Japanese form of *R. roxburghii* var*. hirtula*, (or is it a new species (?)), which has the very unusual characteristic of developing typical tree form, reaching heights of 5 m and upwards. Work with this rose may yield roses which grow like small trees, hopefully rivaling the flowering cherries, also from Japan.

Incidentally, the well known *R. roxburghii plena* as seen in Japan in the Sanapia Herb Garden of the Tatsuzaki family, appears much more floriferous with a somewhat different flower form. Use of this for breeding is another possibility.

A very beautiful variant of *R. multiflora, R. multiflora adenochaeta* is wild in Japan. Louis Lens, the great Belgian hybridiser, has already released some lovely shrub roses using this species, for e.g., his Spray series - 'White Spray', 'Pink Spray' etc. But much more is possible. I will not go into detail - the subject of roses in Japan is scheduled to be dealt with, in the conference, by the well known rose scientist, Dr. Yuki Mikanagi.

CHINA : I limit myself to two very interesting heritage roses which have recently reached the rest of the world, as the main subject is dealt with in our conference by Prof. Dr. Guoliang Wang. Indeed China is too vast a country to be dealt with in an outline of this type.

The first rose I would like to mention is the *R. gigantea* hybrid, 'Lijiang Road Climber'. This is a rose combining incredible beauty, in pink, with extraordinary vigour and work with it should lead to remarkable results. Unfortunately, at least under my conditions, both seed and pollen fertility seem to be below par, but the possibilities are so dramatic and merit attention in rose breeding.

An extraordinary old China rose is again from Lijiang – the 'China Rose of the Temple of the Ten Thousand Flowered Camellia'. This lovely rose shows the typical color change from pink to red as the flower matures, is very fertile and vigorous and a must for warm climate rose breeding. A rose species which has recently reached the outside world is the warm climate species, *R. cymosa*, which is a shrub bearing big clusters of single flowers. It is easy to imagine a line of beautiful landscape roses for warm climates if this species could be used in rose breeding. Indeed, Dr. David Byrne of Texas A& M University has already started work on this line.

LAOS : The extensive explorations by Dr. Yoshihiro Ueda in this country are dealt with in his article published in this annual. Arising from his explorations I would like to highlight the following possibilities:

1. *R. tunquinensis* : This species occurs further south than almost all other rose species, in the Bolovens Plateau of Laos at the low altitude of 600m. Warm climate rose breeding would surely benefit from using this species.
2. 'Hume's Blush Tea Scented China', Laos form: Dr.Ueda has described a form of this well known China rose, one of the four 'Stud Chinas' he found in Laos (pictured in his article and reproduced here). The possibilities afforded by this discovery are immense as the original form of 'Hume's Blush' appears to have been lost.

THAILAND : Two very interesting heritage roses have been noticed in Thailand and both of these offer new possibilities in rose breeding.

1. One is 'Gulap Mon'. This is a very fragrant dark pink to red rose in the tradition of the rose variously called 'Maggie' / 'Pacific' / 'Kakinada Red'. This latter is the rose which seems to have traveled around the world and is now grown in countries as far apart as USA, Bermuda, and India. 'Gulap Mon' is fertile, unlike 'Kakinada Red', in my conditions.
2. 'Chulalongorn': This is a very vigorous red rose in the Hybrid Perpetual tradition, very fragrant, and deserves the attention of rose breeders.

In passing, mention must be made of what is called 'Cosmos Rose' in Thailand. This is a fairly compact, single, with clusters of pink and white flowers, in the *R. multiflora* tradition. This is very fertile as well as repeat flowering and warrants attention.

There is also a popular miniature rose called 'Rama IV', after one of the kings of Thailand. It resembles, to some extent, the well known heritage China, 'Perla de Alacanda'. When we visited Thailand we found to our surprise that the China rose called 'Telengana Pink' in India (see below under 'India') was growing happily in a little town in the Petchaboon Hills.

We have included, in this annual, a write-up by Thailand's premier rosarian, Mr. Pojana Nagavajara, affectionately called 'The Father of Roses in Thailand'. What he describes may aptly be called the decline and fall of the modern rose in Thailand, thus underlining the need for separate lines of breeding for Asian climates.

MALAYSIA : Investigations by Mrs. Mariam Ghazali reveal the existence of a group of well adapted roses widely cultivated in this very tropical country. These are the so called 'village roses' of which there are many, in colors like magenta, white, pink and even yellow, which are illustrated in her article in this annual. These roses again are clearly of interest to warm climate rose breeders.

SINGAPORE : Mr. Tuan Ching of Singapore, who shuttles between New York and

Singapore will be giving a talk at the conference, on the heritage roses in Singapore, including some Bourbon-type roses as well as Tea/China types. Pictures of these are published along with the text of his lecture

VIETNAM : With a common border with China we would expect that there would be several heritage roses of Chinese origin in this country, apart from the local heritage rose kinds. Unfortunately we could get information only on two kinds. The first, courtesy of Ms. Nguyen Ngoc Anh, relates to a China type rose somewhat like ‘Old Blush’, which is apparently common in the country. Mr. Guilio Baistrocchi of Italy, who visited Sapa in Vietnam has furnished us with a series of photographs of an interesting rose, in shades of light and dark pink, quite full, and looking like a Tea rose. We publish a picture of this rose. In many ways Vietnam is an unexplored gold mine of plant species. A great opportunity awaits the enterprising rose enthusiast who takes on the challenge of what heritage roses are available in this country.

MYANMAR (BURMA) : Our only contact in Burma is Mr. U Soe Nyunt who sent us a photograph he took in 2008 of *R. clinophylla*, which he found in the northern part of Myanmar near the Irrawaddy River Bank. This is perhaps the first time that a picture of the Burmese version of *R. clinophylla* is being published.

Dr. Yuki Mikanagi has visited Burma and she collected a blush China Tea in Archine Gatin area, en route to Mt. Victoria. We show a photograph of this very full cup-shaped flower .

INDIA : A large number of heritage roses exist in India, a few discovered, and many awaiting discovery. Two of the most interesting of these ‘found roses’ are the China rose ‘Telengana Pink’, widely grown, and which extends to Thailand as mentioned earlier. This rose has defied identification even by the well known rose authority Mr. Fred Boutin of California, USA. As ‘Telengana Pink’ is very well adapted indeed to warm climates it merits the serious attention of rose breeders. The other widespread heritage rose is the Bourbon, ‘Kakinada Red’, already referred to. This again is very well adapted to the south peninsular region of India and thrives even in the southern part of the eastern coast (Coromandel Coast), which is a very difficult place indeed to grow roses.

Among the several heritage roses available are four ‘found roses’ with the study names of ‘Renu’s Apricot Tea’, ‘Rajakkad China’, ‘Madurai Tea’ and ‘Holiday Home Climber’. The first is from our friend Renu’s garden in the Western Ghat area (Cardamom Hills) of Kerala State, 1100 m altitude, and 'Rajakkad China' is from the Palni Hills, an eastern offshoot of the Western Ghats, found in the garden of Rajakkad Resort, at about the same altitude. ‘Madurai Tea’ was located in the ‘plants for sale’ in a nursery in Madurai town (Tamil Nadu). Any rose has to be very heat resistant indeed to withstand the incredibly hot climate of this town. The 'Holiday Home Climber' is a very vigorous climber with large single flowers in pink and white. It is remontant. The foliage has China rose characteristics and is growing well in Mrs. Helga Brichet's garden. We have published pictures of these four roses. But to reiterate what we said earlier, there is little doubt that there are quite a number of heritage roses waiting to be discovered in various parts of India.

Mrs. Helga Brichet in her lecture on Italian Rose Explorers in India will mention about the heritage roses discovered by Mr. Vicky Ducrot in Rajasthan.

Some famous heritage roses are fairly common, for e.g., the very old Tea rose, 'Madame Falcot', which was apparently lost in the country of its origin, France, and which we could find and send to the well-known connossieurs of Tea roses, Becky and John Hook of Roseraie du Desert, France.

PAKISTAN : Dr Mahmooda Hashmi will deal with the old roses and species in Pakistan in her lecture at the conference, so we will confine ourselves to mentioning just a few. The first is that remarkable rose, the red form of *R. foetida persiana*, found by Vicky Ducrot in the Hindu Kush Mountains. Perhaps surprisingly even *R. laevigata* and its hybrid, 'Anemone', are naturalized in Pakistan in the area around the hill-station of Murree. These are called 'Mardan White' and 'Mardan Pink', both in Pakistan and in north India.

AFGHANISTAN and IRAN : Afghanistan is the home of that brilliant yellow species, *R. ecae* - great hybridizing potential here, as is evident from that astonishing species hybrid 'Golden Chersonese', bred by E.F. Allen, Hon. Scientific Adviser to the R.N.R.S., U.K., in the 1970's. It is in fact surprising that a shrub rose of such eye-catching beauty remains relatively obscure, but its existence is an obvious pointer of what is possible.

Like China, Iran is too vast a country with a long tradition of rose culture, in which there are surely many heritage roses waiting to be discovered. Some of the roses of Iran are described by Dr. Yoshihiro Ueda, in his article reproduced in this annual. But we cannot resist speculating why that other golden rose of Iran and other regions of central Asia, *R. hemispherica*, has never been used in rose breeding. There is a tantalizing tale of a mystery golden rose, a very large shrub, thriving in the shade of the Great Mosque in Kashgar, a town at the extreme western boundary of China, as it stretches into central Asia. This must surely be *R. hemispherica*, but how does it grow in shade??

ISLANDS IN THE INDIAN OCEAN : Maldives, Mauritius and Reunion lie in the paths of ships coming from China and further east, bound for Europe, particularly in the 19th century. Roses very difficult to find in Europe, like for e.g., 'Slater's Crimson China', are naturalized in Mauritius, as described by Gwen Fagan, the well known rosarian from S. Africa. An extract from her book ‘Roses in the cape of Good Hope’ forms part of this annual.

We should also mention that the first Bourbon rose,’ R. Edward’ (Edouard) seems to have originated in Reunion (earlier called Ile de Bourbon). But there are alternative theories on the origin of this pioneer hybrid in the intriguingly titled presentation by Mr. Behcet Ciragan, “Traders, Tulips and Roses”.

MIDDLE EAST : Information on heritage roses in the Middle East has been impossible to find though there can be little doubt that many roses of these kinds exist. All that we could secure is a wonderful article on Sufi poetry about roses from that region by Prof. Kawther Mahdi Al-Zwelef of the University of Jordan. Perhaps Mr. Ciragan will throw more light on this region.

We have not dealt with the roses of the northern part of Central Asia as the climate is quite different from the tropical parts of Asia that we have dealt with so far. But we should mention that there are many roses of extraordinary beauty in the area.

In conclusion we would like to emphasise that considering the vast extent of Asia much more remains to be discovered but we felt that at least an outline to begin the process of search for the heritage roses of Asia is very much warranted.

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Indian Rose Annual 2015

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2. 'Chulalongorn': This is a very vigorous red rose in the Hybrid Perpetual tradition, very fragrant, and deserves the attention of rose breeders.

In passing, mention must be made of what is called 'Cosmos Rose' in Thailand. This is a fairly compact single, with clusters of pink and white flowers, in the *R.multiflora* tradition. This is very fertile as well as repeat flowering and warrants attention.

There is also a popular miniature rose called 'Rama IV', after one of the kings of Thailand. It resembles, to some extent, the well known heritage China, 'Perla de Alacanda'. When we visited Thailand we found to our surprise that the China rose called 'Telengana Pink' in India (see below under 'India') was growing happily in a little town in the Petchaboon Hills.

We have included, in this annual, a write-up by Thailand's premier rosarian, Mr. Pojana Nagavajara, affectionately called 'The Father of Roses in Thailand'. What he describes may aptly be called the decline and fall of the modern rose in Thailand, thus underlining the need for separate lines of breeding for Asian climates.

MALAYSIA: Investigations by Mrs. Mariam Ahmad (Ghazali) reveal the existence of a group of well adapted roses widely cultivated in this very tropical country. These are the so called 'village roses' of which there are many, in colors like magenta, white, pink and even yellow, which are illustrated in her article in this annual. These roses again are clearly of interest to warm climate rose breeders.

SINGAPORE: Mr. Tuan Ching of Singapore, who shuttles between New York and Singapore, will be giving a talk at the conference, on the heritage roses in Singapore, including some Bourbon-type roses as well as Tea/China types. Pictures of these are published along with the text of his lecture

VIETNAM: With a common border with China we would expect that there would be several heritage roses of Chinese origin in this country, apart from the local heritage rose kinds. Unfortunately we could get information only on two kinds. The first, courtesy of Ms. Nguyen Ngoc Anh, relates to a China type rose somewhat like 'Old Blush', which is apparently common in the country. Mr. Giulio Baistrocchi of Italy, who visited Sapa in Vietnam has furnished us with a series of photographs of an interesting rose, in shades of light and dark pink, quite full, and looking like a Tea rose. We publish a picture of this rose. In many ways Vietnam is an unexplored gold mine of plant species. A great opportunity awaits the enterprising rose enthusiast who takes on the challenge of what heritage roses are available in this country

MYANMAR (BURMA).Our only contact in Burma is Mr.U Soe Nyunt who sent us a photograph he took in 2008 of *R.clinophylla*, which he found in the northern part of Myanmar near the Irrawaddy River Bank. This is perhaps the first time that a picture of the Burmese version of *R.clinophylla* is being published.

Dr. Yuki Mikanagi has visited Burma and she collected a blush China Tea in Archine Gatin area, en route to Mt. Victoria. We show a photograph of this very full cup-shaped flower.

INDIA: A large number of heritage roses exist in India, a few discovered, and many awaiting discovery. Two of the most interesting of these 'found roses' are the China rose

'Telengana Pink', widely grown, and which extends to Thailand as mentioned earlier. This rose has defied identification even by the well known rose authority Mr. Fred Boutin of California, USA. As 'Telengana Pink' is very well adapted indeed to warm climates it merits the serious attention of rose breeders. The other widespread heritage rose is the Bourbon, 'Kakinada Red', already referred to. This again is very well adapted to the south peninsular region of India and thrives even in the southern part of the eastern coast (Coromandel Coast), which is a very difficult place indeed to grow roses.

Among the several heritage roses available are four 'found roses' with the study names of 'Renu's Apricot Tea', 'Rajakkad China', 'Madurai Tea' and 'Holiday Home Climber'. The first is from our friend Renu's garden in the Western Ghat area (Cardamom Hills) of Kerala State, 1100 m. altitude, and Rajakkad China is from the Palni Hills, an eastern offshoot of the Western Ghats, found in the garden of Rajakkad Resort, at about the same altitude. 'Madurai Tea' was located in the 'plants for sale' in a nursery in Madurai town (Tamil Nadu). Any rose has to be very heat resistant indeed to withstand the incredibly hot climate of this town. The 'Holiday Home Climber' is a very vigorous climber with large single flowers in pink and white. It is remontant. The foliage has China rose characteristics and is growing well in Mrs. Helga Brichet's garden. We have published pictures of these four roses. But to reiterate what we said earlier, there is little doubt that there are quite a number of heritage roses waiting to be discovered in various parts of India.

Mrs. Helga Brichet in her lecture on Italian Rose Explorers in Asia will mention about the heritage roses discovered by Mr. Vicky Ducrot.

Some famous heritage roses are fairly common, for e.g., the very old Tea rose, 'Madame Falcot', which was apparently lost in the country of its origin, France, and which we could find and send to the well-known connossieurs of Tea roses, Becky and John Hook of Roseraie du Desert, France.

PAKISTAN: Dr Mahmooda Hashmi will deal with the old roses and species in Pakistan in her lecture at the conference, so we will confine ourselves to mentioning just a few. The first is that remarkable rose, the red form of *R.foetida persiana*, found by Vicky Ducrot in the Hindu Kush Mountains. Perhaps surprisingly even *R.laevigata* and its hybrid, 'Anemone', are naturalized in Pakistan in the area around the hill-station of Murree. These are called 'Mardan White' and 'Mardan Pink', both in Pakistan and in north India.

AFGHANISTAN and IRAN: Afghanistan is the home of that brilliant yellow species, *R. ecae*. Great hybridizing potential here, as is evident from that astonishing species hybrid 'Golden Chersonese', bred by E.F.Allen, Hon. Scientific Adviser to the R.N.R.S., U.K., in the 1970's. It is in fact surprising that a shrub rose of such eye-catching beauty remains relatively obscure, but its existence is an obvious pointer of what is possible.

Like China, Iran is too vast a country with a long tradition of rose culture, in which there are surely many heritage roses waiting to be discovered. Some of the roses of Iran are described by Dr. Yoshihiro Ueda, in his article reproduced in this annual. But we cannot resist speculating why that other golden rose of Iran and other regions of central Asia, *R.hemispherica*, has never been used in rose breeding. There is a tantalizing tale of a mystery golden rose, a very large shrub, thriving in the shade of the Great Mosque in Kashgar, a town at the extreme western boundary of China, as it stretches into central Asia. This must surely be *R.hemispherica*, but how does it grow in shade??

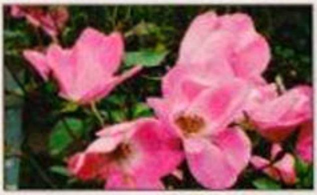
ISLANDS IN THE INDIAN OCEAN: Maldives, Mauritius and Reunion lie in the paths of ships coming from China and further east, bound for Europe, particularly in the 19th century. Roses very difficult to find in Europe, like for e.g., 'Slater's Crimson China', are naturalized in Mauritius, as described by Gwen Fagan, the well known rosarian from S.Africa. An extract from her book 'Roses in the Cape of Good Hope' forms part of this annual.

We should also mention that the first Bourbon rose, 'R.Edward' (Edouard) seems to have originated in Reunion (earlier called Ile de Bourbon). But there are alternative theories on the origin of this pioneer hybrid in the intriguingly titled presentation by Mr. Behcet Ciragan, " Traders, Tulips and Roses'.

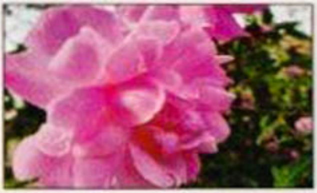
MIDDLE EAST : Information on heritage roses in the Middle East has been impossible to find though there can be little doubt that many roses of these kinds exist. All that we could secure is a wonderful article on Sufi poetry about roses from that region by Prof. Kawther Mahdi Al-Zwelef of the University of Jordan. Perhaps Mr. Ciragan will throw more light on this region

We have not dealt with the roses of the northern part of Central Asia as the climate is quite different from the tropical parts of Asia that we have dealt with so far. But we should mention that there are many roses of extraordinary beauty in the area.

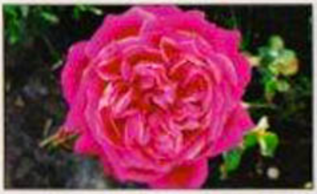
In conclusion we would like to emphasise that considering the vast extent of Asia much more remains to be discovered but we felt that at least an outline to begin the process of search for the heritage roses of Asia is very much warranted.



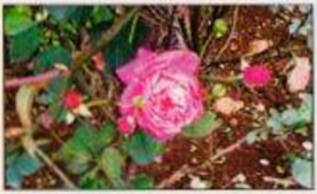
VIRROSEA -laevigata rosea hybrid



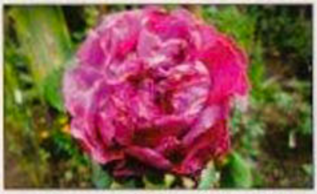
China type rose -Vietnam



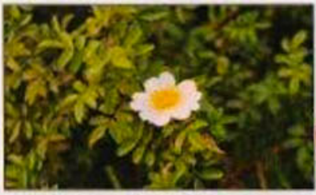
Gulap Mon -Thailand



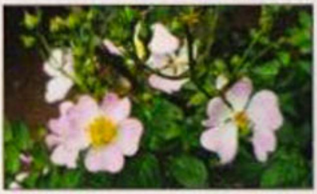
Tea rose - Sapa, Vietnam



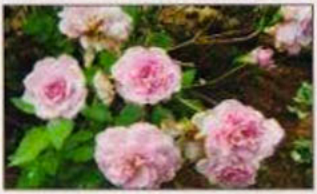
Chulalongorn -Thailand



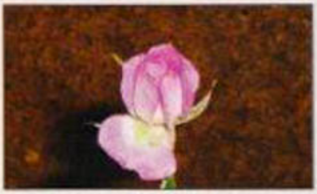
R. Clinophylla in Burma



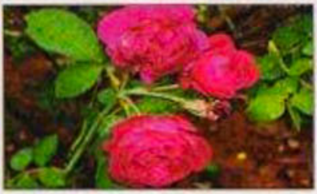
Cosmos Rose -Thailand



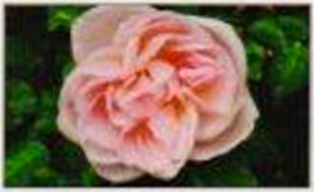
Telengana Pink



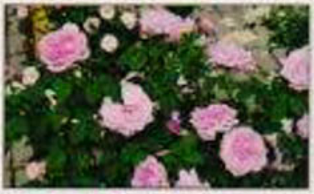
Rama IV - Thailand



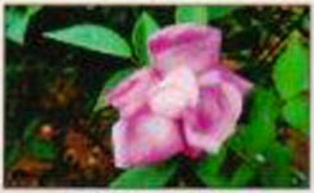
Kakinada Red



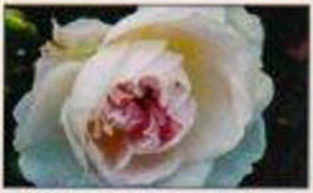
Renu ApricotTea



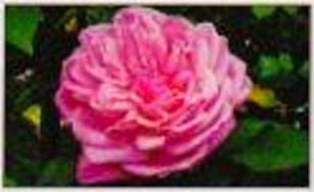
Rose Edward



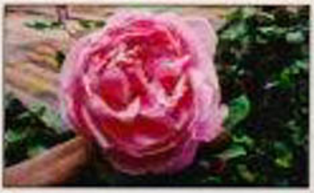
Rajakkad China



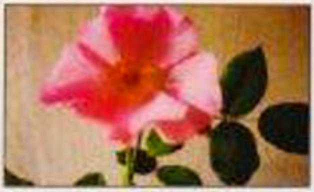
Burma Archine Gatin China



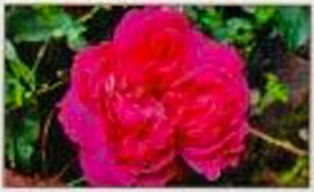
Madurai Tea



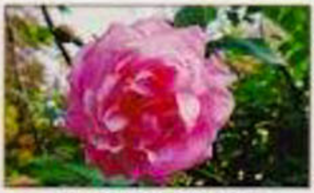
Kerala Tea



Holiday Home climber



Pondicherry Bourbon



Qing Yan Blush China

Indian Rose Annual - IRA 2015

Born in the forest, reborn in the garden: A tale of two Indian rose species

Girija and M.S. Viraraghavan

At the outset we would like to squarely face the question of why Indian rose species are required for breeding roses for India and other warm climate regions of the world. The answer is that work with these species makes horticultural sense. The choice is not jingoistic.

Warm climate rose breeding has been largely neglected in the world. Tropical countries depend almost completely on roses bred for cold hardiness in Europe and the U.S.A. These roses have a very short life in our heat, excepting in some favoured locations. As the Western breeding for cold hardy roses progressed from generation to generation, these roses became less and less suitable for warm areas.

The early H.T.'s, for e.g. 'La France' from Europe and 'Radiance' from the U.S., were comparatively better suited for warmth, but the newer varieties, excepting for some 'freaks' cannot be grown in a sustainable way.

We have to therefore create a separate line of breeding for warm regions. Where do we start? Clearly, with the Teas, Chinas, and Noisettes. Out of hundreds of these classes raised, mainly in France, in the latter part of the 19th century, only a few remain which do well for us. But the stupendous efforts put in by French breeders led to the genetic possibilities of the strain getting exhausted. Fresh blood is thus required and this is provided by the two rose species which figure in this talk.

It is indeed fortunate that these two species – *R. clinophylla* and *R. gigantea,* perform well in a wide range of warm climates. *R. clinophylla* is perhaps the world's only tropical rose species. *R. gigantea*, on the other hand, grows luxuriantly in sub-tropical climates without harsh frosts. In addition, it is blessed with great vigour and disease resistance. It is our submission that there is no doubt that these two species are the logical start for warm climate rose breeding.

Rosa clinophylla

Three forms exist, adapted to warm moist climate (Bengal form), warm dry climate (Chota-Nagpur form) and subtropical form.

The Bengal form is, by any criterion, the most tropical form of this species. Its habitat is described, with eye-catching detail in the 'Himalayan Journals' of J. D. Hooker, the famous plant explorer who came upon this species when his explorations brought him from the foothills of the Himalayas to the plains of North Bengal, by the banks of a tributary of the River Ganges :

"*On the 7th of May (1850), about 80 miles in a straight line from the foot of the Himalaya, we found the stratified sandy banks, which had gradually risen to a height of thirteen feet, replaced by the hard alluvial clay of the Gangetic valley, which underlies the sand: the stream contracted, and the features of its banks were materially improved by a jungle of tamarisk, wormwood (Artemisia), and white rose bushes (Rosa involucrata, now called R. clinophylla), whilst mango trees became common, with tamarinds, banyans and figs. Date and caryota palms, and rattan canes, grew in the woods, and orchids on the trees, which were covered with a climbing fern (Acrosticum scandens), so that we easily doubled our flora of the river banks before arriving at Maldah".*

Expanding on Hooker's observation we may point out that this species is typically found in flood plains and the islands of the Ganges, which are very often submerged during the monsoon rains.

In some ways getting a plant of this variant proved to be the most difficult of searches. Even in the late 19th century the species was characterised by the unusual feature of appearing in profusion where the swampy conditions suited, but again showing up very much further on – many apparently suitable habitats were completely bereft of the rose. With the rapid spread of agriculture, its habitat is under grave threat, but to our good fortune, the well known horticulturist of Bengal, Dr. S. Bannerjee, had collected a plant quite near where Hooker had observed it – at the point where the River Padma branches off from the main Ganges and flows towards what is now Bangladesh. In his tiny garden in Kolkata grew a solitary plant, perhaps the only one in cultivation when we began our search from 1967. It is rather extraordinary that even the Botanical Survey of India could not give us any information. Finally, in 1990, (after two decades!) Dr. N.C. Sen, rosarian of Asansol (in West Bengal) and our friend, was able to send us a plant, made from the original with Dr. Bannerjee.

The Chota Nagpur form of *R. clinophylla* had reached us earlier. Mr. Narender Singh of Ranchi, also a rose enthusiast, while on a hunting expedition, had camped by the side of a forest stream in the Chota Nagpur Plateau of Bihar State. In the early dawn light he saw, to his surprise, a rose growing by the stream's side. He recalled our interest in *R. clinophylla*, and correctly identifying this rose, he sent us some cuttings, from which our first breeding work with this species began.

Looking for the 3rd form of *R. clinophylla*, the low mountain form, involved an expedition to one of the last reported findings of this rose on Mount Abu, rising to 1300 m., located, somewhat unpromisingly in the Thar Desert of Rajasthan State. The species was found here in 1888 by a George King. He gave no more details as to the location. So off we went to Mt Abu and explored likely places, mainly the banks of streams, for several days without any success. Two additional problems made our search difficult. The State Forest Department had planted large areas with *R. multiflora*, which led to considerable confusion. The other problem was that, in the language of this area, Hindi, all roses are referred to as ‘gulab’ which refers to a pink rose, and we were looking for a white rose. Ultimately, we did what we should have done earlier - travelling around the forest with a local farmer, whom we met on the way and whom we persuaded to accompany us. Our somewhat reluctant guide proved to be much more knowledgeable than at first sight. He led us to some agricultural fields next to a lake, and lo and behold, the boundaries of the fields were planted with hedges of our rose.

There were even a few blooms to confirm the identification, though it was well past the main flowering period - it was mid-winter. There were many other bushes of the rose next to the lake margin and we were able to collect a few, as well as take photographs of the flowers. These were borne in corymbs, unlike the usual solitary flowers of the other two forms. But why does this form prefer slightly cooler habitat? We later read the observation of the noted Belgian taxonomist of the 19th century, M. François Crépin, who felt that this variant, also called *R. lyelli*, was probably a hybrid with R. *moschata.*

The search for *Rosa gigantea*

The species was discovered by Sir George Watt in 1882 and later by Frank Kingdon Ward. And Sir Henry Collett who found the rose in Burma also in the 1880s.

Securing plant material of *R. gigantea* was even more complicated. All that we knew was that the species was available at the very end of the Eastern Himalayas, with a concentration of occurrence in the mountains of Manipur State, in North East India.

A visit to the Botanical Survey of India’s Herbarium in Kolkata in 1990, gave us a clue. One of the original specimens collected by Sir George Watt in 1882 was available in the herbarium. A further clue came when we, accidentally, met a scientist who had worked in Manipur, on the steps of the BSI office. In fact we were leaving, and by sheer chance we were accompanied by the Director of this government institution. Seeing us in the company of the latter, the scientist was more forthcoming than he had been when we had written to him earlier, requesting for information on this species. He told us it was to be found on the lower slopes of Mt. Sirohi, which rises to about 5,000 m, beyond the town of Ukhrul. Reaching Ukhrul involved a long arduous and cold drive, as it is on the border with Myamnar (Burma) at an altitude of 1,200 m. Tribals stopped us on the way to ascertain that we were not looking for the endangered and protected Sirohi Lily (*Lilium mackliniae*). From Ukhrul we went by jeep to Mt. Sirohi and on the mountain track leading to the top, we walked for a few kms. And then, to our delight, we found huge climbing bushes of the rose. It was peak winter and dew lay frozen on the ground. Our excitement equalled that of the explorer/botanist, Frank Kingdon Ward, who has described his encounter with this rose on the same mountain:

‘One of the most amazing sights was a huge scrambling rose, which sprawled determinedly over the trees in every lane and copse. The largest specimen we saw had what I can only describe as a trunk, as thick as a man’s forearm, from which sprang several stems, each more than a hundred feet long and all heavily armed with strong flat prickles’. After the stems pierced the top of the forest canopy, he observes *‘Now that it had come through the roof into the open, it greeted the sunshine by hanging out banners of flowers on every side. The chubby leaves, still soft and limp, were a deep red; the slim pointed flower buds a pale daffodil yellow; but when the enormous flowers opened, they were ivory white, borne singly all along the arching sprays, each petal faintly engraved with a network of veins like a watermark. The shock of orange capped stamens made a perfect centre-piece, and the flower distilled a delicate fragrance. What a sight was this great dog rose throughout March, lording it over the thickets, festooning the tallest trees, and hanging from every limb in cascade of scented flowers the size of tea cups… the globose hips look like crab apples. They are yellow with rosy cheeks when ripe.’*

Fortunately for us, there were a large number of the previous year’s hips, though no flowers. We collected some, as well as many cuttings, and returned feeling exhilarated. Only one of the more than hundred cuttings sprouted, but the seeds produced many seedlings. And thus started our work with plants of *R. gigantea,* which first flowered in 1994, in our mountain home in Kodaikanal.

We now come to the various stages by which the garden roses were evolved starting from the original wild species.

Taking up *R. clinophylla* first, we would like to point out that genetically this species is very far removed from the modern garden rose. There is also the problem that *R. clinophylla* is a diploid and modern roses are tetraploid. Its only close relative is *R. bracteata*, which is a species of Myanmar and Southern China though well established in several places in India.

Two different approaches were adopted in this program. The first of these involved crosses with the well known Tea rose, ‘Mrs B. R. Cant’ which does very well even in the warm areas of India. The second was utilizing the floribunda ‘Little Darling’, a tetraploid which was extensively used by the great breeder, Ralph Moore, in his crosses with different roses, giving a clear indication that it was responsive to unusual pollen.

Taking up breeding with ‘Mrs B. R. Cant’ first, it proved extremely difficult to get viable seed from the cross [‘Mrs B. R. Cant’ x *R. clinophylla* (Bihar form)] – out of over 200 pollinations, less than 50 seeds were obtained, of which only two germinated. The first promptly perished, but we were lucky with the second one - initially rather weak, it however survived to produce single pink flowers which, surprisingly, repeated. A back cross into ‘Mrs B.R. Cant’ again resulted in a much more vigorous and fertile plant of the Tea rose persuasion in dark pink with semi-double flowers. This seedling, nicknamed ‘Pink-Pink’ figures in our various crosses at the diploid level.

Work with ‘Little Darling’ was somewhat easier. We did not use *R. clinophylla* itself but a more vigorous hybrid of *R. clinophylla* and *R. bracteata*. The logic of this was that while as we mentioned earlier, *R. clinophylla* occupies a very moist habitat, *bracteata* prefers drier locations, so we felt that the hybrid seedling would be more adaptable to garden conditions. A large number of crosses were raised quite easily since the two species are closely related. We chose a very vigorous seedling which appeared to be half-way between the two parent species as our pollen parent for breeding with 'Little Darling', and from the resultant plants one appeared to have some promise, though rather weak, with pinky orange flowers but repeat blooming.

We will take up our work using this seedling with 'Little Darling' first, as the program was easier. The first step was to cross this into a well known H.T. 'Montezuma', which is well adapted to the Indian heat. From the cross came a fairly double orange rose, reasonably fertile and vigorous, code-named 'Virmont'. Re-crossed into the yellow H.T. Landora (Sunblest) produced 'Landmont' which was the starting point for a range of garden roses along with some similar seedlings, such as a cross between 'Arthur Bell' (yellow floribunda) and the 'Little Darling' derivative, (in an effort to introduce yellow colour), as well as a straight cross with the dwarf shrub 'Bonica'. 'Bonica' has, as many of you know, several evergreen roses in its parentage and was introduced in to my breeding line in the hope that evergreen roses would result.

In this background two hybrids were introduced in 2005 – 'Ganges Mist' which is a vigorous fully double white flowered pillar rose with large flowers in the old rose form; and a white to creamy pink shrub 'Silver Dawn', result of inter-crosssing 'Bonica', *clinophylla* and the van Fleet climber 'Silver Moon'. 'Silver Moon' was used in the hope that *R. laevigata* genes figured, as was thought, in its parentage. Unfortunately DNA analysis has shown that 'Silver Moon' has no l*aevigat*a genes.

The best of this series so far is the repeat flowering shrub 'Pat Henry' ('Narender' in India), resulting from a cross involving the yellow H.T. 'Landora' ('SunBlest' in the U.S) with 'Virmont' and 'Ganges Mist'. 'Pat Henry' is a healthy plant bearing very fragrant flowers in shades of pink with hints of salmon orange. The flower which has H.T. form at bud stage, opens to old rose form. We speculate that the distinctive fragrance of this rose is the gift of *R. clinophylla*. Under Mrs. Pat Henry's care (she is the proprietor of the well known U.S. rose nursery Roses Unlimited) the rose sported to a shrub with orange yellow flowers, which she has requested to be called 'Stan Henry'. There are many other roses in the pipeline but we do face a problem in testing for heat resistance, and more will be introduced once this is sorted out.

Coming to the *clinophylla* line starting from 'Pink-Pink', an interesting result has been the appearance of several comparatively dwarf growing roses but with flowers of almost Tea rose size, arising from the cross with the Noisette, 'Rêve d'Or' which does well in India. The first to be released from this group is 'Ganges Nymph', which has flowers of a very unusual form, reminiscent of *R. chinensis serratipetala*. The flowers have a very prominent green eye, which is attractive or not, according to taste.

Two other approaches in *clinophylla* breeding have also been tried. The first is to use a complex heat resistant seedling, which has the genes of 'Bonica' and some Tea roses as the seed parent, with 'Pink-Pink'. One result has been a dwarf healthy shrub which flowers freely in shades of pink with a white eye. The second approach is to use a species hybrid seedling of *clinophylla* x *gigantea* with other roses. One interesting result is a cross with 'Mrs B.R. Cant'. A further cross of this with the found China rose, 'Telengana Pink' has led to an elegant H.T. form climber which will be the basis of further work.

R. gigantea

Work with *R. gigantea* has been somewhat easier as genes of this species are present in garden roses though perhaps remotely. Two types of crosses have been used. The first is crosses of *R. gigantea* with 'Rêve d'Or' mentioned earlier as doing well in India. The second is a cross of *R. gigantea* into the orange red H.T. 'Carmosine', which is well adapted to Indian conditions.

Early on we understood the unanticipated bonus of using *R. gigantea* in breeding - the H.T. form so loved by the majority of rose growers is the gift of this species. Crosses with 'Rêve d'Or' were unexpectedly successful as several climbers could be raised. These were generally once flowering though as the varieties matured some of them did repeat. One of the most interesting results was 'Amber Cloud' with real amber coloured buds and single flowers in cooler weather, and creamy yellow when it got hot. One of our friends wanted this rose to be called Golden Gigantea. - which gives an idea of how this plant performs. 'Amber Cloud' has been admired both in southern USA and southern Europe. Another important seedling with the cross with 'Rêve d'Or' is 'Manipur Magic', a fully double light yellow rose looking uncommonly like 'Marechal Niel' on steroids. This is a vigorous climber with lovely bronzy green foliage as an added attraction.

Two sister seedlings with double flowers, one creamy yellow with a much darker yellow base and the other, ivory, were named 'Sir George Watt' and 'Sir Henry Collett' to honour the two plant explorers who discovered *R. gigantea* in Manipur and Myanmar.

Coming to the crosses with 'Carmosine' we were lucky that the lovely broad petals of this rose were inherited by the crosses. One of the most charming, with beautiful H.T. form flowers in shades approaching the colour of 'Lady Hillingdon' was named 'Maebara's Dream', as a token of our appreciation for the great encouragement we had received from Katsuhiko Maebara, the guiding spirit behind the Sakura Heritage Rose Garden near Tokyo, Japan.

A second seedling with very large H.T. form flowers in apricot yellow to creamy yellow was introduced as 'Evergreen Gene' to honour or friend Gene Waering of USA who does so much to popularize the idea of evergreen roses for warm climates.

The third of the series is a spectacular yellow and pink climber called ‘Frank Kingdon Ward’ after the great plant explorer who rediscovered *R. gigantea* in the mountains of Manipur.

Meanwhile we made the interesting observation that the well known rose ‘Carefree Beauty’, bred by Griffith Buck of the U.S. for cold hardy climates, had, additionally, the quality of being well adapted to heat. A cross of ‘Carefree Beauty’ with ‘Maebara’s Dream’ produced the shocking pink, repeat flowering H.T. form shrub with comparatively restrained growth for a gigantea (only around 5 feet) named ‘Naga Belle’, named for the Naga tribe of Manipur area. A similar cross of ‘Carefree Beauty’ and ‘Evergreen Gene’ led to ‘Allegory of Spring’ with delicately beautiful H.T. form flowers in shell pink opening to old rose form, again repeat flowering.

The use of the floribunda ‘Brown Velvet’ with ‘Maebara’s Dream’ produced ‘Sirohi Sunrise’ a pillar rose with browny orange blooms, which in turn crossed with ‘Golden Showers’ led to ‘Golden Threshold’, a compelling shade of dark yellow with anthers of brown verging on chrysanthemum crimson. This climber performs well in many parts of the world. I show you a photograph taken in Serbia.

Used in further crosses ‘Golden Threshold’ is yielding a range of shrub roses in eye catching colours. Many other hybrid *giganteas* using different combinations of modern roses with our *gigantea* strains are in the pipeline.

As many of you are aware the Tea roses are closely connected with *R. gigantea* and it is no surprise that several new Tea roses have been hybridized arising from the same type of crosses. One of them is ‘Faith Whittlesey’ which does well in warm climates, another is the shell pink with a hint of apricot ‘Lotus Born’. ‘Aussie Sixer’, apricot yellow has been named in honour of the six Australian ladies who have written the new classic book on Tea roses.

In conclusion we would like to reiterate that it is perfectly possible to start from a rose species and create garden roses in a reasonable span of time. We mention this in the hope that younger rose breeders will take up the challenge of creating new roses, by enlarging the genetic base of the modern garden rose so essential if the rose is to remain the world’s favourite flower.

Copies of the original

Indian Rose Annual 2015

Born in the forest, reborn in the garden A tale of two Indian rose species

Girija and M.S.Viraraghavan

At the outset we would like to squarely face the question of why Indian rose species are required for breeding roses for India and other warm climate regions of the world. The answer is that work with these species makes horticultural sense. The choice is not jingoistic.

Warm climate rose breeding has been largely neglected in the world. Tropical countries depend almost completely on roses bred for cold hardiness in Europe and the U.S.A. These roses have a very short life in our heat, excepting in some favoured locations. As the Western breeding for cold hardy roses progressed from generation to generation, these roses became less and less suitable for warm areas. The early H.T.'s, for e.g.,'La France' from Europe and 'Radiance' from the U.S., were comparatively better suited for warmth, but the newer varieties, excepting for some 'freaks' cannot be grown in a sustainable way.

We have to therefore create a separate line of breeding for warm regions. Where do we start? Clearly, with the Teas, Chinas and Noisettes. Out of hundreds of these classes raised, mainly in France, in the latter part of the 19th century, only a few remain, which do well for us. But the stupendous efforts put in by French breeders led to the genetic possibilities of the strain getting exhausted. Fresh blood is thus required and this is provided by the two rose species which figure in this talk.

It is indeed fortunate that these two species – *R. clinophylla* and *R.gigantea* perform well in a wide range of warm climates.

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R.clinophylla is perhaps the world's only tropical rose species. *R.gigantea*, on the other hand, grows luxuriantly in subtropical climates without harsh frosts. In addition, it is blessed with great vigour and disease resistance. It is our submission that there is no doubt that these two species are the logical start for warm climate rose breeding.

R. clinophylla

Three forms exist, adapted to warm moist climate (Bengal form), warm dry climate (Chota Nagpur form) and subtropical climate (Himalayan foothills and some other mountain ranges). The Bengal form, is, by any criterion, the most tropical form of this species. Its habitat is described, with eye-catching detail in the 'Himalayan Journals' of J.D.Hooker, the famous plant explorer who came upon this species when his explorations brought him from the foothills of the Himalayas to the plains of North Bengal, by the banks of a tributary of the River Ganges :

"On the 7th of May (1850), about 80 miles in a straight line from the foot of the Himalaya, we found the stratified sandy banks, which had gradually risen to a height of thirteen feet, replaced by the hard alluvial clay of the Gangetic valley, which underlies the sand: the stream contracted, and the features of its banks were materially improved by a jungle of tamarisk, wormwood (Artemisia), and white rose bushes (Rosa involucrata, now called R.clinophylla), whilst mango trees became common, with tamarinds, banyans and figs. Date and caryota palms, and rattan canes, grew in the woods, and orchids on the trees, which were covered with a climbing fern (Acrosticum scandens) , so that we easily doubled our flora of the river banks before arriving at Maldah'.

Expanding on Hooker's observation we may point out that this species is typically found in flood plains and the islands of the Ganges, which are very often submerged during the monsoon rains.

In some ways getting a plant of this variant proved to be the most difficult of searches. Even in the late 19th century the species was characterised by the unusual feature of appearing in profusion where the swampy conditions suited, but again showing up very much further on – many apparently suitable habitats were completely bereft of the rose. With the rapid spread of agriculture, its habitat is under grave threat, but to our good fortune, the well known horticulturist of Bengal, Dr. S. Bannerjee, had collected a plant quite near where Hooker had observed it – at the point where the River Padma branches off from the main Ganges and flows towards what is now Bangladesh. In his tiny garden in Kolkata grew a solitary plant, perhaps the only one in cultivation when we began our search from 1967. It is rather extraordinary that even the Botanical Survey of India could not give us any information. Finally, in 1990,(after two decades!) Dr. N.C.Sen, rosarian of Asansol (in West Bengal) and our friend, was able to send us a plant, made from the original with Dr Bannerjee.

The Chota Nagpur form of *R.clinophylla* had reached us earlier. Mr. Narender Singh of Ranchi, also a rose enthusiast, while on a hunting expedition, had camped by the side of a forest stream in the Chota Nagpur Plateau of Bihar State. In the early dawn light he saw, to his surprise, a rose growing by the stream's side. He recalled our interest in *R.clinophylla*, and correctly identifying this rose, he sent us some cuttings, from which our first breeding work with this species began.

Looking for the 3rd form of *R.clinophylla*, the low mountain form, involved an expedition to one of the last reported findings of this rose on Mount Abu, rising to 1300 m. , located, somewhat unpromisingly in the Thar Desert of Rajasthan State. The species was found here in 1888 by a George King. He gave no more details as to the location .So off we went to Mt Abu and explored likely places, mainly the banks of streams, for several days without any success. Two additional problems made our search difficult. The State Forest Department had planted large areas with *R.multiflora*, which led to considerable confusion. The other problem was that, in the language of this area, Hindi, all roses are referred to as 'gulab' which refers to a pink rose, and we were looking for a white rose. Ultimately, we did what we should have done earlier- travelling around the forest with a local farmer, whom we met on the way and whom we persuaded to accompany us. Our somewhat reluctant guide proved to be much more knowledgeable than at first sight. He led us to some agricultural fields next to a lake, and lo and behold, the boundaries of the fields were planted with hedges of our rose. There were even a few blooms to confirm the identification, though it was well past the main flowering period – it was mid-winter. There were many other bushes of the rose next to the lake margin and we were able to collect a few, as well as take photographs of the flowers. These were borne in corymbs, unlike the usual solitary flowers of the other two forms. But why does this form prefer slightly cooler habitat? We later read the observation of the noted Belgian taxonomist of the 19th century, M. Francois Crepin, who felt that this variant, also called *R. lyelli*, was probably a hybrid with R.*moschata*.

The search for *R.gigantea*

Securing plant material of *R.gigantea* was even more complicated. All that we knew was that the species was available at the very end of the Eastern Himalayas, with a concentration of occurrence in the mountains of Manipur State, in North East India.

A visit to the Botanical Survey of India's Herbarium in Kolkata in 1990, gave us a clue. One of the original specimens collected by Sir George Watt in 1882 was available in the herbarium. A further clue came when we, accidentally, met a scientist who had worked in Manipur, on the steps of the BSI office. In fact we were leaving, and by sheer chance we were accompanied by the Director of this government institution. Seeing us in the company of the latter, the scientist was more forthcoming than he had been when we had written to him earlier, requesting for information on this species. He told us it was to be found on the lower slopes of Mt. Sirohi, which rises to about 5000m., beyond the town of Ukhrul. Reaching Ukhrul involved a long arduous and cold drive, as it is on the border with Myamnar (Burma) at an altitude of 1200m.

Tribals stopped us on the way to ascertain that we were not looking for the endangered and protected Sirohi Lily (*Lilium mackliniae*). From Ukhrul we went by jeep to Mt Sirohi and on the mountain track leading to the top, we walked for a few kms. And then, to our delight, we found huge climbing bushes of the rose. It was peak winter and dew lay frozen on the ground. Our excitement equalled that of the explorer/ botanist, Frank Kingdon Ward, who has described his encounter with this rose on the same mountain:

'One of the most amazing sights was a huge scrambling rose, which sprawled determinedly over the trees in every lane and copse. The largest specimen we saw had what I can only describe as a trunk, as thick as a man's forearm, from which sprang several stems, each more than a hundred feet long and all heavily armed with strong flat prickles'. After the stems pierced the top of the forest canopy, he observes *'Now that it had come through the roof into the open, it greeted the sunshine by hanging out banners of flowers on every side. The chubby leaves, still soft and limp, were a deep red; the slim pointed flower buds a pale daffodil yellow; but when the enormous flowers opened, they were ivory white, borne singly all along the arching sprays, each petal faintly engraved with a network of veins like a watermark. The shock of orange capped stamens made a perfect centre-piece, and the flower distilled a delicate fragrance. What a sight was this great dog rose throughout March, lording it over the thickets, festooning the tallest trees, and hanging from every limb in cascade of scented flowers the size of tea cups...the globose hips look like crab apples. They are yellow with rosy cheeks when ripe.'*

Fortunately for us, there were a large number of the previous year's hips, though no flowers. We collected some, as well as many cuttings, and returned feeling exhilarated. Only one of the more than hundred cuttings sprouted, but the seeds produced many seedlings.And thus started our work with plants of *R. gigantea*, which first flowered in 1994, in our mountain home in Kodaikanal.

We now come to the various stages by which the garden roses were evolved starting from the original wild species.

Taking up *R.clinophylla* first, we would like to point out that genetically this species is very far removed from the modern garden rose. There is also the problem that *R.clinophylla* is a diploid and modern roses are tetraploid. Its only close relative is *R.bracteata*, which is a species of Myanmar and Southern China though well established in several places in India.

Two different approaches were adopted in this program. The first of these involved crosses with the well known Tea rose, 'Mrs. B.R.Cant' which does very well even in the warm areas of India. The second was utilizing the floribunda 'Little Darling', a tetraploid which was extensively used by the great breeder, Ralph Moore, in his crosses with different roses, giving a clear indication that it was responsive to unusual pollen.

Taking up breeding with 'Mrs B. R. Cant' first, it proved extremely difficult to get viable seed from the cross ['Mrs B R Cant' x *R.clinophylla* (Chota Nagpur form)] – out of over 200 pollinations , less than 50 seeds were obtained, of which only two germinated. The first promptly perished, but we were lucky with the second one— initially rather weak, it however survived to produce single pink flowers which, surprisingly, repeated. A back cross into 'Mrs B.R.Cant' again resulted in a much more vigorous and fertile plant of the Tea rose persuasion in dark pink with semi-double flowers. This seedling, nicknamed 'Pink-Pink' figures in our various crosses at the diploid level.

Work with 'Little Darling' was somewhat easier. We did not use *R.clinophylla* itself but a more vigorous hybrid of *R.clinophylla* and *R. bracteata*. The logic of this was that while as we mentioned earlier, *clinophylla* occupies a very moist habitat, *bracteata* prefers drier locations, so we felt that the hybrid seedling would be more adaptable to garden conditions. A large number of crosses were raised quite easily since the two species are closely related. We chose a very vigorous seedling which appeared to be half-way between the two parent species as our pollen parent for breeding with 'Little Darling', and from the resultant plants one appeared to have some promise, though rather weak, with pinky orange flowers but repeat blooming.

We will take up our work using this seedling with 'Little Darling' first, as the program was easier. The first step was to cross this into a well known H.T.' Montezuma', which is well adapted to the Indian heat. From the cross came a fairly double orange rose, reasonably fertile and vigorous, code-named 'Virmont', and this was the starting point for a range of garden roses along with some similar seedlings, such as a cross between 'Arthur Bell' (yellow floribunda) and the 'Little Darling' derivative, (in an effort to introduce yellow colour), as well as a straight cross with the dwarf shrub 'Bonica'. 'Bonica' has, as many of you know, several evergreen roses in its parentage and was introduced in to our breeding line in the hope that evergreen roses would result.

In this background two hybrids were introduced in 2005 – 'Ganges Mist' which is a vigorous fully double white flowered pillar rose with large flowers in the old rose form; and a white to creamy pink shrub 'Silver Dawn', result of inter-crosssing 'Bonica', *clinophylla* and the van Fleet climber 'Silver Moon'. 'Silver Moon' was used in the hope that *R. laevigata* genes figured, as was thought, in its parentage. Unfortunately DNA analysis has shown that 'Silver Moon' has no *laevigata* genes.

The best of this series so far is the repeat flowering shrub 'Pat Henry' ('Narender' in India), resulting from a cross involving the yellow H.T. 'Landora' ('SunBlest' in the U.S) with 'Virmont' and 'Ganges Mist'. 'Pat Henry' is a healthy plant bearing very fragrant flowers in shades of pink with hints of salmon orange. The flower which has H.T. form at bud stage, opens to old rose form. We speculate that the distinctive fragrance of this rose is the gift of *R.clinophylla*. Under Mrs. Pat Henry's care (she is the proprietor of the well known U.S. rose nursery Roses Unlimited)the rose sported to a shrub with orange yellow flowers, which she has requested to be called 'Stan Henry'. There are many other roses in the pipeline but we do face a problem in testing for heat resistance, and more will be introduced once this is sorted out.

Coming to the *clinophylla* line starting from 'Pink –Pink', an interesting result has been the appearance of several comparatively dwarf growing roses but with flowers of almost Tea rose size, arising from the cross with the Noisette, 'Reve d'Or', which does well in India. The first to be released from this group is 'Ganges Nymph', which has flowers of a very unusual form, reminiscent of *R.chinensis serratipetala*. The flowers have a very prominent green eye, which is attractive or not, according to taste.

Two other approaches in *clinophylla* breeding have also been tried. The first is to use a complex heat resistant seedling, which has the genes of 'Bonica' and some Tea roses as the seed parent, with 'Pink-Pink'. One result has been a dwarf healthy shrub which flowers freely in shades of pink with a white eye. The second approach is to use a species hybrid seedling of *clinophylla* x *gigantea* with other roses. One interesting result is a cross with 'Mrs B.R.Cant'. A further cross of this with the found China rose, 'Telengana Pink' has led to an elegant H.T. form climber which will be the basis of further work.

Work with *R.gigantea* has been somewhat easier as genes of this species are present in garden roses though perhaps remotely. Two types of crosses have been used. The first is crosses of *R. gigantea* with 'Reve d'Or' mentioned earlier as doing well in India. The second is a cross of *R gigantea* into the orange red H.T.'Carmosine', which is well adapted to Indian conditions.

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Two sister seedlings with double flowers, one creamy yellow with a much darker yellow base and the other, ivory, were named 'Sir George Watt' and 'Sir Henry Collett' to honour the two plant explorers who discovered *R. gigantea* in Manipur and Myanmar.

Coming to the crosses with 'Carmosine' we were lucky that the lovely broad petals of this rose were inherited by the crosses. One of the most charming, with beautiful H.T. form flowers in shades approaching the colour of 'Lady Hillingdon' was named 'Maebara's Dream', as a token of our appreciation for the great encouragement we had received from Katsuhiko Maebara, the guiding spirit behind the Sakura Heritage Rose Garden near Tokyo, Japan.

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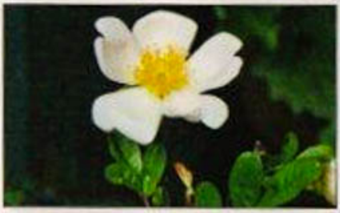
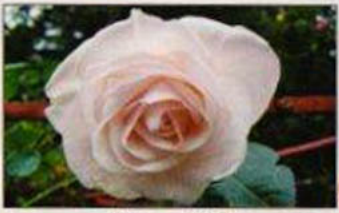
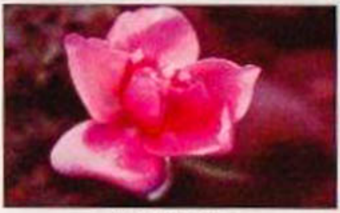
R.clinophylla habitat



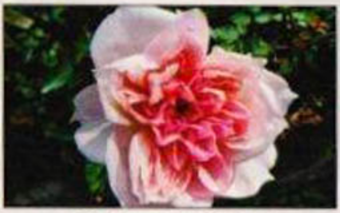
R.clinophylla



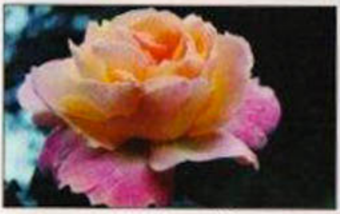
Ganges Mist



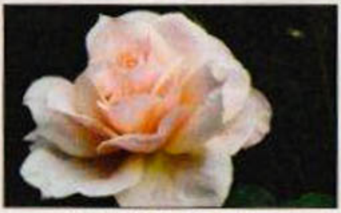
"PinkPink"



Reved'or x "PinkPink"



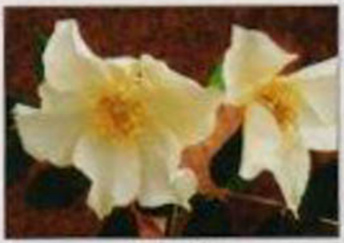
"Landmont"



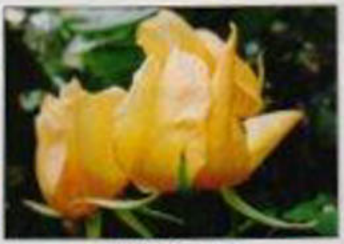
Narender/Pat Henry

R.gigantea habitat

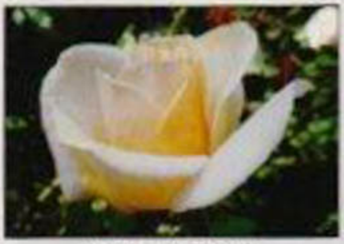
Golden Threshold



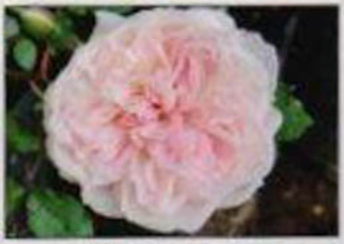
R.gigantea



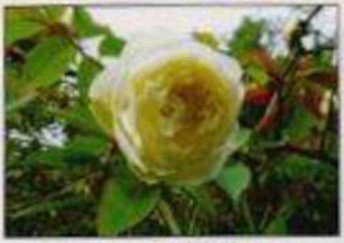
Amber Cloud



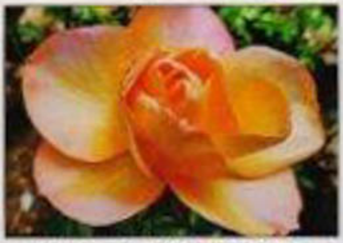
Maebara's Dream



Allegory of Spring



Manipur Magic



Vishnupriya/Helga's Quest

Indian Rose Annual - IRA 2016

Leschenault de la Tour and His Rose *Rosa leschenaultiana*

Girija Viraraghavan

The upper reaches (over 6000 feet, 1800 metres elevation) of the southern Indian mountain range, called the Western Ghats, is home to a rose species, belonging to the musk rose complex, named *Rosa leschenaultiana*, after a French naturalist and ornithologist, Jean Baptiste Leschenault de la Tour. He found this rose species, among other new plant varieties, like a mahonia, a vaccinium and many others (all of which have his name attached to them) in the forests of the 'Neilgherries and Pulney Mountains' of South India in the early 1800's.

Leschenault (1773 - 1826) was an intrepid botanical adventurer, traveling with Nicolas Baudin on his sea voyage to Australia (1800-1803) , then to Java and other parts of Malesia, India and Ceylon, and later to South America. While many plant species were discovered by him on his travels, the entire plant family of *Leschinaultia* of Australia comprises a range of beautiful shrubs with flowers in incomparable shades of blue. We saw them in all their glory in the Botanic Garden, outside Perth in Western Australia.

Born in Le Villard, near Chalons-sur-Saone, (in Burgundy), the son of a judge, his botanical interests took him all around the world. He married Margueritte Bonier on April 19, 1796 (his wedding certificate found by Dominique Massad), presumably on his return to France after one of his many world voyages. He collected plant and bird specimens in every country, and sent them back to Paris. His herbarium specimens and some of his documents are housed in the National Herbarium (Phanerog.), whilst his other manuscripts are with the Library of Natural History Museum, both in Paris.

While in South America he botanised in Brazil and Surinam; he introduced tea to Cayenne, capital of French Guyana. Ill health forced him to return home, where he died in his own home, which we are told is still retained by his family, though he himself seems to have been childless.

He came to India in 1816 as *'inquisitor rerum naturae'* and was made Director of a botanic garden 'Jardin Royal de Pondichéry' in Pondicherry, then a French territory. He was given permission by the British in Fort St George, Madras (now Chennai) to travel in the areas under their governance, in order to make botanical collections. He is said to have sent seeds and plant material to the Island of Reunion, in the Indian Ocean, also a French territory. He was in India till 1822.

He sent material of the rose species he found in the hills to the botanist Claude Antoine Thory in France, who named it *Rosa leschenaultiana*. Redouté made his drawing of the rose in 'Les Roses', from Leschenault's herbarium specimens.

Ellen Willmott in 'Genus Rosa' writes that '*R. leschenaultiana* has often been called the South Indian form of *Rosa moschata* Mill. But it is a perfectly good and distinct species. It is closely related to the South European *Rosa sempervirens* L., thereby referring to its evergreen character. Its leaflets are 5 to 7, elliptic, oblong, 1.5 to 2.5 inches across, numerous, in large corymbs; the buds very acute; the fruits globose'. It was considered a 'geographical form', 'being more robust, with larger flowers and with very glandular leaf petioles, pedicels and calyx'.

The modern view however is different as it is considered to be a part of the musk rose complex.

It is now called *R. leschenaultiana* (Thory) Wight & Arn. (Robert Wight also discovered it in 1836 in the same Nilgiri and Palni Mountains). Earlier its nomenclature was either *R. sempervirens* var *leschenaultiana* Redouté & Thory, (in Redoute, 'Les Roses', 1824) or *R. moschata* var. *leschenaultiana* Rehder (in Bailey 1902).

The distinctive feature of this straggling climbing rose is its violet-purple stems. Once very luxuriant and common in the forests, festooning native 'shola' trees to a height of 60 to 70 feet with long trails of single pure white flowers, faintly fragrant, it is increasingly getting rarer, with the onset of development. In the Centenary Rose Garden in Ooty, (short for Ootacamund, now called Uthagamandalam, the capital town of the district of the Nilgiris, in the state of Tamil Nadu, south India) the hedges on either side of the wide entrance steps, are of this rose species, commonly called the 'Ooty rose'.

In the hills where we live, the Palni Hills, a sister mountain to the Nilgiris (both a part of the Western Ghats) while the rose grows in the inner fastnesses of the forests, we have found it in a location by the side of a road leading to an interior hill village, making it easy to take rose enthusiasts to see this special rose species growing in the wild. We have a plant growing in our garden, clambering over our back verandah.

Viru has hybridized with this species and he has named and registered a seedling, a cross between Rêve d'Or and *R. leschenaultiana* as 'Leschenault de la Tour' to honor and memorialise the Frenchman who traversed our hills in the early 1800's.

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Indian Rose Annual 2016

Leschenault de la Tour and His Rose

Mrs. Girija Viraraghavan

The upper reaches (over 6000feet, 1800metres elevation) of the southern Indian mountain range, called the Western Ghats, is home to a rose species, belonging to the musk rose complex, named *Rosa leschenaultiana*, after a French naturalist and ornithologist, Jean Baptiste Leschenault de la Tour. He found this rose species, among other new plant varieties, like a mahonia, a vaccinium and many others (all of which have his name attached to them) in the forests of the 'Neilgherries and Pulney Mountains' of south India in the early 1800's.

Leschenault (1773- 1826) was an intrepid botanical adventurer, traveling with Nicolas Baudin on his sea voyage to Australia (1800-1803) , then to Java and other parts of Malesia, India and Ceylon, and later to South America. While many plant species were discovered by him on his travels, the entire plant family of *leschinaultia* of Australia comprises a range of beautiful shrubs with flowers in incomparable shades of blue. We saw them in all their glory in the Botanic Garden, outside Perth in Western Australia.

Born in Le Villard, near Chalons-sur-Saone, (in Burgundy), the son of a judge, his botanical interests took him all around the world. He married Margueritte Bonier on April 19, 1796 (his wedding certificate found by Dominique Massad), presumably on his return to France after one of his many world voyages. He collected plant and bird specimens in every country, and sent them back to Paris. His herbarium specimens and some of his documents are housed in the National Herbarium(Phanerog.), whilst his other manuscripts are with the Library of Natural History Museum, both in Paris.

While in South America he botanised in Brazil and Surinam; he introduced tea to Cayenne, capital of French Guyana. Ill health forced him to return home, where he died in his own home, which we are told

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is still retained by his family, though he himself seems to have been childless.

He came to India in 1816 as *'inquisitor rerum naturae'* and was made Director of a botanic garden 'Jardin Royal de Pondichéry' in Pondicherry, then a French territory. He was given permission by the British in Fort St George, Madras (now Chennai) to travel in the areas under their governance, in order to make botanical collections. He is said to have sent seeds and plant material to the Island of Reunion, in the Indian Ocean, also a French territory. He was in India till 1822.

He sent material of the rose species he found in the hills to the botanist Claude Antoine Thory in France, who named it *Rosa leschenaultiana*. Redoute made his drawing of the rose in 'Le Roses', from Leschenault's herbarium specimens.

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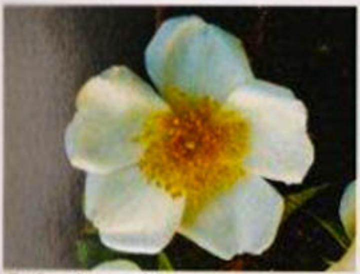
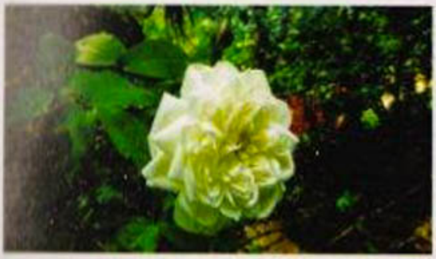
Leschenault de la Tour



R. leschenaultiana

Blooms on *R. leschenaultiana*, a climber



'Leschenault de la Tour'
a new hybrid by
Mr. M.S. Viraraghavan

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Two Rose Mysteries – An Appearance and a Disappearance

Girija and M.S. (Viru) Viraraghavan

Mia Grondahl's fascinating account of her love affair with Rose Edward is a difficult act to follow, but we will try.

The first mystery is the rather sudden appearance of Rose Edward, the universally popular pink, incredibly fragrant garland rose, so well known in India. As mentioned in Mia's article, the standard view on how Rose Edward originated relates to roses in Reunion Island in the Indian Ocean, called Ile de Bourbon when it was a French possession in the 18th and 19th centuries. According to this version, rose hedges were common around farmers fields in Reunion, and were planted with two kinds of roses growing close together, the China rose 'Old Blush' also called 'Parson's Pink China (which is continuous blooming) and the twice blooming 'Autumn Damask', also called *R. damascena bifera*, 'Quatre Saisons, and Bussorah (in Hindi). A hybrid seedling of these two roses arose by accident and this was Rose Edward (Edouard), a continuous flowering pink semi-double rose with, as we mentioned earlier, a most captivating fragrance. This new rose was noticed by M. Perichon, a garden superintendent in Reunion, and plants and seeds were distributed by him both in France and in India, as well as in Mauritius (?).

That Rose Edward arose in Reunion is hotly disputed by no less a person than India's premier hybridizer, Mr. B.S. Bhatcharji, who says that this rose was known from 'times immemorial' in India. Adding to the mystery is the fact that one of the early centres of large scale cultivation of this rose was Thanjavur District in the Cauvery River delta of Tamil Nadu state, even as early as the 1800's.

Could a rose originating in Reunion become that popular in India is such a short period?

Earnest efforts are on to unravel this mystery between Girija and me, Mia Grondahl in Sweden, Behcet Ciragan in Switzerland, Daniel Lemonnier in France and several other rose historians in the USA.

One advance is the DNA study of 'Hermosa' (see article in this annual) which establishes that one parent of Rosa Edward was definitely 'Old Blush'. Perhaps the theory that the other parent is Autumn Damask could be established if we analyze the findings of the earlier DNA study referred to in this article, namely the research paper entitled 'The Triparental origin of the Damask Rose' by Iwata *et al*, reported in 'Gene' Vol. 259, No. 1, 23rd December 2000, pgs 53-59, referred to by Behcet Ciragan in his article Tulips Trades and Roses, published in IRA 2015. We may also mention that both the supposed parents of R. Edward, Old Blush and Autumn Damask have been growing in India for a very long time.

The basic difficulty in accepting the Reunion origin theory, as Behcet and several others point out, is the fact that Reunion is a tropical island in the Indian Ocean, where the winters are virtually non existent. Could a rose like the Autumn Damask flower under such conditions? It requires winter chill to flower in the typical manner of the other damask roses.

Another curious point is that Rose Edward itself exists in two forms, the standard repeat flowering bush form and another kind, growing much taller which flowers very rarely but which was a preferred root stock in north India before the advent of the indica rootstock. We had the benefit of discussing about the two forms with the well known rosarian of Lucknow, Mr J.P. Agarwal. Even if the bush form came from Reunion, who would bother to introduce a virtually non-flowering kind from that island to India?

So there you have the unsolved (as yet) mystery of the appearance of Rose Edward. Any input on this from rosarians from India and abroad would be most welcome.

The other mystery relates to the disappearance of what is probably the first ever hybrid of *Rosa clinophylla* - the rose of the tropical areas of Bengal, Bihar and many other places in India, of course excluding *R. x hardii*, the supposed hybrid of *R. clinphylla* and *R. persic*a. We are referring to the rose called 'koozea' in Hindi, also known as the 'Rose of the Doon' and *Rosa lyellii*. *R. lyellii* is the name of one of the forms of *R. clinophylla* which is to be found in the more sub-tropical areas of the distribution of *R. clinophylla* in India. That authority on gardening in India in the early years of the last century, Rev. Firminger of Calcutta, describes this rose as *'a plant of extensive growth common in the Upper Province's* (probably referring to Uttar Pradesh State) '*but not met with, that I am aware of, near Calcutta; bears large handsome double blush flowers'.* We have been searching for this rose for many years, as it is a variety obviously of great importance in rose breeding for Indian conditions, but to no avail. Since the variety is called 'Rose of the Doon' we consulted that well known rosarian, Mr Arpi Thakur who came from that area but he could not trace the variety. Later, we learned that this rose was extensively cultivated in the Botanic Garden in Saharanpur, in British times. Saharanpur is near Dehra Doon in U.P. Unfortunately this garden is no longer in existence but there is still an agricultural extension centre in what was the botanic garden, where perhaps plants of *R. lyelli* may still be growing. Here is a challenge for rose friends especially those from north India. Consider visiting Saharanpur in February/March and be the discoverer of this most important rose. It is really a mystery waiting to be unraveled - a mystery of great horticultural importance. The disappearance of this rose, described by no less an authority as Firminger as 'common' in the Upper Provinces is indeed unbelievable. Hopefully, it can still be found.

In conclusion we should mention that the well known book The Genus Rosa by the great English horticulturist Ellen Willmot has an illustration of what is called 'a garden form' of *Rosa clinophylla* which we reproduce. Is this a picture of 'koozea'? Commenting on this picture, there is an observation in Genus Rosa that the plate (picture) shows a plant known in gardens as *Rosa clinophylla* (garden form) 'in which the character of toothed stipules and bracts has almost disappeared'.

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Rose Edward

Rosa Involucrata (later called clinophylla)
"garden form" (perhaps *R.Lyellii*)
in Genus Rosa

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Indian Rose Annual - IRA 2017

Frank Kingdon Ward – The man, The rose.

Girija and M.S. (Viru) Viraraghavan

On February 10th 2016 a rather unusual ceremony took place, in the churchyard of the small village of Grantchester, which is just a few miles away from Cambridge, U.K. Several important people of the rose world in the UK gathered, on that clear, cold morning, for a solemn ceremony to plant a rose.

Let me tell you the story of how this happened.

As you know, Viru has been hybridizing with the rose species, *Rosa gigantea*, and he has registered and released many new hybrids. Some are climbers and some are shrubs. He felt that it would be most appropriate to name some of these new roses after the great plant hunters who first discovered the species in earlier centuries. So, one was named for Sir George Watt, who found *R. gigantea* in 1882, in the Manipur Hills, (north east India) in the Sirohi forest outside Ukhrul town, near the border with Myanmar. Another hybrid was named for General Sir Henry Collett who around the same time – 1882 - found the species in the Shan Hills of Myanmar (then called Burma).

The third, and much later, discoverer of *R. gigantea*, was Frank Kingdon Ward, (1885-1958) the legendary plant hunter of the 20th century.

In fact it could rightly be said that the passing of Frank Kingdon-Ward, towards the end of the ‘50s of the last century, signaled the close of the great era of plant hunting, which so enriched the gardens of the world.

Kingdon-Ward was born with uncommon advantages – his father was a Professor of Botany in Cambridge University, and he was fortunate in the great men who sponsored his botanical expeditions. But God had bestowed on him one tremendous handicap – a debilitating fear of heights. Yet he spent his plant collecting life of nearly half a century tramping the most dangerous mountainous areas of the world – the eastern Himalayas and the adjoining mountains of the Burmese triangle, where three nations meet. Plant hunting in this harsh terrain required determination and courage in overcoming natural hazards, as well as unusual flair in selecting the best plants for the world's gardens. We must admire his physical courage, but we must admire even more his conquest of the demons of the mind. In his search for the best specimens of each species he almost invariably re-lived the hazards twice over. He would explore the area in spring to select the best forms of the plants he was looking for, and again in autumn to collect the seeds.

No wonder the plants introduced by him set new standards in plant collection.

Kingdon-Ward was a great romantic. If we look at the titles of some of the books he wrote – 'The Land of the Blue Poppy', 'The Mystery Rivers of Tibet', 'Plant Hunting on the Edge of the World' – we are justifiably thrilled by his love affair with the haunting beauty of the mountains he traversed, and the exaltation of spirit he must have felt in his search for beautiful plants.

His descriptions of the plants he encountered are so intoxicating, we can feel his excitement to this day. His delight at the sighting of the blue poppy, *Meconopsis betanicifolia,* in Tibet, his description of *Rhododendron cerasinum*, which he found in Upper Burma, bearing flowers of brilliant scarlet, with five coal black nectar pouches at the base, as 'coals of fire', and, above all, at least for us, his rapturous description of *Rosa gigantea,* on the slopes of Mount Sirohi, in north east India, as 'climbing the forest trees and bearing great golden globes like golden magnolias, visible from afar', are just a few instances of his ability to evoke the romance of plant hunting.

Here is FK-W's description of finding this rose on the mountainous border between India and Burma:

‘One of the most amazing sights was a huge scrambling rose, which sprawled determinedly over the trees in every lane and copse. The largest specimen we saw had what I can only describe as a trunk, as thick as a man’s forearm, from which sprang several stems, each more than a hundred feet long and all heavily armed with strong flat prickles… The chubby leaves, still soft and limp, were a deep red; the slim pointed flower buds a pale daffodil yellow; but when the enormous flowers opened, they were ivory white, borne singly all along the arching sprays, each petal faintly engraved with a network of veins like a watermark. The shock of orange-capped stamens made a perfect centrepiece, and the flower distilled a delicate fragrance. What a sight was this great dog rose throughout March, lording it over the thickets, festooning the tallest trees, and hanging from every limb in cascade of scented flowers the size of tea cups… the globose hips look like crab apples. They are yellow with rosy cheeks when ripe.’
(Frank Kingdon-Ward: ‘Plant Hunter in Manipur’, 1952)

We therefore felt that one of our gigantea hybrid climbers should be named for him. As with the roses named for Watt and Collett, we got in touch with the family, his descendants (the Internet makes it comparatively easy to search and locate families) to ask for permission for the naming. His grandson Oliver Tooley who maintains a website on his grandfather, www.french4tots.co.uk/kingdon-ward/fkw-biog.html, readily agreed to have a rose named for his illustrious forebear. The rose was registered in 2012 with the International Rose Registration Authority.

In 2014, we read a letter written by a Matthew Biggs in the Royal Horticultural Society (R.H.S., of which society we have been members for decades) journal, ‘The Garden’ where he bemoaned the fact that while politicians and other similar people have their graves kept in immaculate condition, plant hunters who have risked life and limb in order to bring new species of plants into the gardening world, are sadly forgotten. And he mentioned visiting the churchyard in Grantchester, where Kingdon Ward lies buried. (Actually a casket containing his ashes, is buried, and there is a headstone marking the place).

Reading the letter we had an inspiration. Would it not be befitting and appropriate if somehow we could have the rose we had named for Kingdon Ward planted near his grave?

We wrote to the RHS, who put us in touch with Matthew Biggs. We did not know that he was a well known and popular horticultural author and television broadcaster, for BBC Radio 4. Matthew was immediately taken with our idea and agreed to start the ball rolling. We contacted grandson Oliver too, as it would require everyone's help to persuade the Parochial Church Council of Grantchester to agree to this unusual request. It took sometime, and mush correspondence, but they very graciously agreed and a good warm south facing church wall, near the grave was decided upon for receiving the rose.

Next we had to send the plant material to England. Michael Marriott, of David Austin Roses (English Roses) who is our good friend, happened to know Michael Biggs too. He readily agreed to our request to propagate the rose. So, with all the proper documentation, the bud-wood was dispatched.

As Matthew said '*'The rose is not available in England, so the only solution was for me to find a rose nursery in England to propagate the rose (fortunately, these communications took place in August, the correct time of year for rose propagation). After several hurried phone calls to people I knew, Michael at David Austin Roses said 'yes', and budwood was immediately flown to Britain. The first batch died in the chill of the aircraft hold, the second delivery was OK and sixteen 'Frank Kingdon Ward' roses are now growing at David Austin's Rose Nursery in Shropshire.'*

By February this year (2016) the plants had grown and were ready to be planted. Matthew Biggs was masterminding the entire project. He had to find a date which suited the church authorities, and the Kingdon Ward family.

Invitations were sent out:

Grantchester Parochial Church Council
has much pleasure in inviting you to
THE PLANTING OF THE KINGDON-WARD ROSE
by Matthew Biggs from BBC Radio 4's
'Gardeners Question Time'
on **10th February 2016**
at **11.00am**
in the Churchyard, followed by a glass of wine
in the Church. If you would like to attend, **please RSVP** to
caroburkitt@gmail.com by **6th February 2016**

Michael Marriott and other well known names in the rose world, like Peter Harkness and Robert Mattock, Maurice Foster the distinguished plantsman, and the National Trust Head Gardeners from various gardens associated with Kingdon Ward and other rose historians took the trouble to travel on a cold wintry morning to grace the occasion.

Kingdon Ward's 90 year old daughter, Pleoine, (through his first wife, Florinda) and her children, including Oliver Tooley, and their children, making 3 generations of the family, were at the ceremony.

Also present was the niece of Ward's second wife, Jean, nee Macklin (The *Lilium macklinii*, found also in Sirohi, when *R. gigantea* was discovered, is named for her, as she was with him on that trip. After Kingdon Ward's death in 1958 she married Albert Rasmussen, a Norwegian botanist, but she kept in touch with Oliver Tooley, Frank's grandson. She died in 2011 aged 90.). Many of our friends and, on our behalf, a niece and husband who teach in Cambridge University, were there.

It was a beautiful occasion. Oliver gave a moving eulogy, Maurice Foster had agreed to read our citation, and others spoke about the great plant explorer. Jean Macklin's ashes, kept in an urn, had been brought by her niece, and they were scattered in the pit dug for the rose, and then the rose was planted. Finally Frank and Jean were together.

The Grantchester Church Council had done the occasion proud and everyone who attended said, and wrote to us, that it was a most memorable and moving event.

Matthew wrote to us that never before had he been part of such an emotionally inspiring function. *’It has been a lovely story and a fascinating day. I am still blown away by the whole thing, even more moving was that Frank and Jean have been reunited at last, which is lovely.’*

As we concluded in the citation we wrote, and which Maurice Foster read out:

‘While writing these few words on Kingdon-Ward, surrounded by hundreds of blooms of Rosa gigantea in our garden, which we collected from the same slopes of Mount Sirohi, where he found the rose, we wonder how the gardeners of the world can ever repay the debt they owe to this great plant hunter. Naming, and planting a hybrid gigantea rose, in his memory, is our simple tribute to him. We feel that the grave of Kingdon-Ward could be described in the spirit of Rupert Brooke’s ‘The Soldier’, as a corner of an English field which is forever the Himalayas.’

Matthew Biggs is keen, as we are, that more ‘Frank Kingdon Ward’ rose plants should be planted in gardens associated with him -- Christ Church College, where Frank studied and Cambridge Botanic Gardens, Borde Hill in West Sussex, Mount Stewart Garden in Ireland and Mottisfont, in Hampshire.

Matthew wrote to us in mid April 2016, *‘The Frank Kingdon Ward rose was duly planted at Borde Hill by Roy Lancaster (the well known horticulturist and writer) on Friday with about twenty people in attendance. It is in a good sheltered location and should do well. I told the story, Roy spoke a bit about F K W then put a few spades full of earth over the roots and firmed it in’.*

The next step has been taken. Michael Marriott is kindly propagating more plants of this rose and they will be distributed across the UK to gardens which have an association with the intrepid and amazing plant collector of yesteryear.

Now to the details of the rose. It is a hybrid gigantea climber, perhaps not as vigorous as ‘Sir George Watt’ and ‘Sir Henry Collett’. It is a cross between the French Hybrid Tea rose ‘Carmosine’ and *R. gigantea*. It has large flowers with beautiful form and creamy yellow stained pink flowers, very eye-catching when the blooms can be seen up a pergola or tree.

Copies of the original

Indian Rose Annual 2017

Frank Kingdon Ward – The man, The rose

Girija and M.S.Viraraghavan

On February 10th 2016 a rather unusual ceremony took place, in the churchyard of the small village of Grantchester, which lies just a few miles away from Cambridge, U.K. Several important people of the rose world in the UK gathered, on that clear, cold morning, for a solemn ceremony to plant a rose.

Let us tell you the story of how this happened.

As you know, Viru has been hybridizing with the rose species, *Rosa gigantea*, and he has registered and released many new hybrids. Some are climbers and some are shrubs. He felt that it would be most appropriate to name some of these new roses after the great plant hunters who first discovered the species in earlier centuries. So, one was named for Sir George Watt, who found *R. gigantea* in 1882, in the Manipur Hills, (north east India) in the Sirohi forest outside Ukhrul town, near the border with Myanmar. Another hybrid was named for General Sir Henry Collett who around the same time – 1882- found the species in the Shan Hills of Myanmar (then called Burma).

The third, and much later, discoverer of *R .gigantea*, was Frank Kingdon Ward, (1885-1958) the legendary plant hunter of the 20th century.

In fact it could rightly be said that the passing of Frank Kingdon-Ward, towards the end of the '50s of the last century, signaled the close of the great era of plant hunting, which so enriched the gardens of the world.

Kingdon-Ward was born with uncommon advantages – his father was a Professor of Botany in Cambridge University, and he was fortunate in the great men who sponsored his botanical

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expeditions. But God had bestowed on him one tremendous handicap – a debilitating fear of heights. Yet he spent his plant collecting life of nearly half a century tramping the most dangerous mountainous areas of the world – the eastern Himalayas and the adjoining mountains of the Burmese triangle, where three nations meet. Plant hunting in this harsh terrain required determination and courage in overcoming natural hazards, as well as unusual flair in selecting the best plants for the world's gardens. We must admire his physical courage, but we must admire even more his conquest of the demons of the mind. In his search for the best specimens of each species he almost invariably re-lived the hazards twice over. He would explore the area in spring to select the best forms of the plants he was looking for, and again in autumn to collect the seeds.

No wonder the plants introduced by him set new standards in plant collection.

Kingdon-Ward was a great romantic. If we look at the titles of some of the books he wrote – 'The Land of the Blue Poppy', 'The Mystery Rivers of Tibet', 'Plant Hunting on the Edge of the World' – we are justifiably thrilled by his love affair with the haunting beauty of the mountains he traversed, and the exaltation of spirit he must have felt in his search for beautiful plants.

His descriptions of the plants he encountered are so intoxicating, we can feel his excitement to this day. His delight at the sighting of the blue poppy, *Meconopsis betanicifolia,* in Tibet, his description of *Rhododendron cerasinum* , which he found in Upper Burma, bearing flowers of brilliant scarlet, with five coal black nectar pouches at the base, as 'coals of fire', and, above all, at least for us, his rapturous description of *Rosa gigantea,* on the slopes of Mount Sirohi, in north east India, as *'climbing the forest trees and bearing great golden globes like golden magnolias, visible from afar'*, are just a few instances of his ability to evoke the romance of plant hunting.

Here is his description of finding this rose on the mountainous border between India and Burma :

'One of the most amazing sights was a huge scrambling rose, which sprawled determinedly over the trees in every lane and copse. The largest specimen we saw had what I can only describe as a trunk, as thick as a man's forearm, from which sprang several stems, each more than a hundred feet long and all heavily armed with strong flat prickles... The chubby leaves, still soft and limp, were a deep red; the slim pointed flower buds a pale daffodil yellow; but when the enormous flowers opened, they were ivory white, borne singly all along the arching sprays, each petal faintly engraved with a network of veins like a watermark. The shock of orange-capped stamens made a perfect centre piece, and the flower distilled a delicate fragrance. What a sight was this great dog rose throughout March, lording it over the thickets, festooning the tallest trees, and hanging from every limb in cascade of scented flowers the size of tea cups... the globose hips look like crab apples. They are yellow with rosy cheeks when ripe.'

(Frank Kingdon-Ward: 'Plant Hunter in Manipur', 1952)

We therefore felt that one of our gigantea hybrid climbers should be named for him. As with the roses named for GeorgeWatt and Henry Collett, we got in touch with the family, his descendants (the Internet makes it comparatively easy to search and locate families) to ask for permission for the naming. His grandson Oliver Tooley who maintains a website on his grandfather, www.french4tots.co.uk/kingdon-ward/ fkw-biog.html, readily agreed to have a rose named for his illustrious forebear. The rose was registered in 2012 with the International Rose Registration Authority

In 2014, we read a letter written by a Matthew Biggs in the Royal Horticultural Society (R.H.S., of which society we have been members for decades) journal, 'The Garden' where he bemoaned the fact that while politicians and other similar people have their graves kept in immaculate condition, plant hunters who have risked life and limb in order to bring new species of plants into the gardening world, are sadly forgotten. And he mentioned visiting the churchyard in Grantchester, where Kingdon Ward lies buried. (actually a casket containing his ashes, is buried, and there is a headstone marking the place).

Reading the letter we had an inspiration. Would it not be befitting and appropriate if somehow we could have the rose we had named for Kingdon Ward planted near his grave?

We wrote to the RHS, who put us in touch with Matthew Biggs. We did not know that he was a well known and popular horticultural author and television broadcaster, for BBC Radio 4. Matthew was immediately taken with our idea and agreed to start the ball rolling. We contacted grandson Oliver too, as it would require everyone's help to persuade the Parochial Church Council of Grantchester to agree to this unusual request. It took sometime, and mush correspondence, but they very graciously agreed and a good warm south facing church wall, near the grave was decided upon for receiving the rose.

Next we had to send the plant material to England. Michael Marriott, of David Austin Roses ('English Roses') who is our good friend, happened to know Michael Biggs too. He readily agreed to our request to propagate the rose. So, with all the proper documentation, the bud-wood was dispatched.

As Matthew said '*The rose is not available in England, so the only solution was for me to find a rose nursery in England to propagate the rose (fortunately, these communications took place in August, the correct time of year for rose propagation). After several hurried phone calls to people I knew, Michael at David Austin Roses said 'yes', and bud-wood was immediately flown to Britain. The first batch died in the chill of the aircraft hold, the second delivery was OK and sixteen 'Frank Kingdon Ward' roses are now growing at David Austin's Rose Nursery in Shropshire.*'

By February this year (2016) the plants had grown and were ready to be planted. Matthew Biggs was masterminding the entire project. He had to find a date which suited the church authorities, and the Kingdon Ward family.

Invitations were sent out:

Grantchester Parochial Church Council
has much pleasure in inviting you to
THE PLANTING OF THE KINGDON-WARD ROSE
by Matthew Biggs from BBC Radio 4's
'Gardeners Question Time'
on **10th February 2016**
at **11.00am**
in the Churchyard, followed by a glass of wine
in the Church. If you would like to attend, **please RSVP** to
caroburkitt@gmail.com by **6th February 2016**

Michael Marriott and other well known names in the rose world, like Peter Harkness and Robert Mattock, Maurice Foster the distinguished plantsman, and the National Trust Head Gardeners from various gardens associated with Kingdon Ward and other rose historians took the trouble to travel on a cold wintry morning to grace the occasion.

Kingdon Ward's 90 year old daughter, Pleoine, (through his first wife, Florinda) and her children, including Oliver Tooley, and their children, making 3 generations of the family, were at the ceremony to honor the memory of an illustrious ancestor.

Also present was the niece of Ward's second wife, Jean, nee Macklin (the *Lilium macklinii*, found also in Sirohi, when R.gigantea was discovered, is named for her, as she was with him on that trip. After Kingdon Ward's death in 1958 she married Albert Rasmussen, a Norwegian botanist, but she kept in touch with Oliver Tooley, Frank's grandson. She died in 2011 aged 90.) Many of our friends and, on our behalf, a niece and husband who teach in Cambridge University, were there.

It was a beautiful occasion. Oliver gave a moving eulogy, Maurice Foster had agreed to read our citation, and others spoke about the great plant explorer. Jean Macklin's ashes, kept in an urn, had been brought by her niece, and they were scattered in the pit dug for the rose, and then the rose was planted. Finally Frank and Jean were together.

The Grantchester Church Council had done the occasion proud and everyone who attended said , and wrote to us, that it was a most memorable and moving event.

Matthew wrote to us that never before had he been part of such an emotionally inspiring function. *'It has been a lovely story and a fascinating day. I am still blown away by the whole thing, even more moving was that Frank and Jean have been reunited at last, which is lovely.'*

As we concluded in the citation we wrote, and which Maurice Foster read out,

'While writing these few words on Kingdon-Ward, surrounded by hundreds of blooms of Rosa gigantea in our garden, which we collected from the same slopes of Mount Sirohi, where he found the rose, we wonder how the gardeners of the world can ever repay the debt they owe to this great plant hunter. Naming, and planting a hybrid gigantea rose, in his memory, is our simple tribute to him. We feel that the grave of Kingdon-Ward could be described in the spirit of Rupert Brooke's 'The Soldier', as a corner of an English field which is forever the Himalayas.'

Matthew Biggs is keen, as we are , that more 'Frank Kingdon Ward' rose plants should be planted in gardens associated with him -- Christ Church College, where Frank studied and Cambridge Botanic Gardens, Borde Hill in West Sussex , Mount Stewart Garden in Ireland and Mottisfont, in Hampshire.

Matthew wrote to us in mid April 2016, '*The Frank Kingdon Ward rose was duly planted at Borde Hill by Roy Lancaster (the well known horticulturist and writer) on Friday with about twenty people in attendance. It is in a good sheltered location and should do well. I told the story, Roy spoke a bit about F K W, then put a few spades full of earth over the roots and firmed it in*'.

The next step has been taken. Michael Marriott is kindly propagating more plants of this rose and they will be distributed across the UK to gardens which have an association with the intrepid and amazing plant collector of yesteryear.

Now to the details of the rose. It is a hybrid gigantea climber, perhaps not as vigorous as 'Sir George Watt' and 'Sir Henry Collett'. It is a cross between the French Hybrid Tea rose 'Carmosine' and *R. gigantea*. It has large flowers with beautiful form and creamy yellow stained pink flowers, very eye-catching when the blooms can be seen up a pergola or tree. A soft fragrance wafts in the air from up above when the flowers open.

(Pictures on Page 172)

> *"Some people grumble that roses have thorns: I am grateful that thorns have roses."*
> *— Alphonse Karr, A Tour Round My Garden*
>
> *"It seems strange that my life should end in such a terrible place, but for three years I had roses, and apologized to no one."*
> *— Alan Moore, V for Vendetta*

Frank Kingdon Ward - The Man, The Rose

Frank Kingdon Ward

Frank Kingdon Ward

Frank Kingdon Ward,
a Climbing Hybrid Gigantea

Headstone of Frank Kingdon Ward's
Grave in Grantchester Church

Planting of the Rose

The Attendees at the Ceremony

Indian Rose Annual - IRA 2018

Sri Mushti Lakshminarayana
A great horticulturist and rose grower of Vijaywada

Girija and Viru Viraraghavan

One of the great rosarians of Vijayawada and later, Hyderabad, was Mr. Mushti Lakshminarayana. We felt that it was appropriate that we highlight some aspects of his career as a rosarian *par excellence* in the hope that it will inspire and encourage the members of the newly formed Andhra Pradesh Rose Society to follow in his footsteps.

When we thought about writing this article about this yester-year rosarian, we contacted his grandson, M. N. Srinivas, who kindly sent us these biographical details:

“Sri Mushti Lakshminarayana was born on the 19th of June 1890 at Siddhantham village in West Godavari District of Andhra Pradesh. He was the eldest son of Sri Mushti Ramakrishnaiah Pantulu (Headmaster of a school at Bhimavaram who also, incidentally, started the first girls school in Bhimavaram). After completing his basic schooling at Bhimavaram, Lakshminarayana went to Chennai to do his F.A. (equivalent of plus 2) and then further did his BA and LLB from Madras Presidency College. He returned to Bhimavaram and started his practice as a criminal lawyer. He had a great passion for gardening so he grew fruit and flowers in his backyard. It was at this time that he was drawn towards the Freedom Struggle of India which made him quit his law practice and take a plunge into the Non-Cooperation Movement. He served as the President of Bhimavaram Congress from years 1929 - 31. He was arrested during the freedom struggle and spent 3 years in Arvankad prison where he came in close contact with many stalwarts of the Congress Party.

In 1935 after his release from prison, he wanted to pursue his passion of gardening and also wanted to lead a life which would benefit others too. He moved from Bhimavaram to Vijayawada. At that time Sri Kasinathuni Nageshwar Rao Pantulu Garu spoke to the PWD and had him allotted a piece of land for lease along the Ravees canal (presently where the Lenin Statue stands). Sri Lakshminarayana started a plant nursery "DURGA NURSERY & GARDENS" in

1935 on this land. Later, another 8 acres of land was taken on lease from the Durga Malleshwaraswamy Devasthanam where he started propagating varieties of plants like crotons, ixoras, hibiscus etc. It was during this period that he took a fancy to roses. During one of his visits to Hyderabad he found that the climate there was more conducive for roses so he decided to shift and bought land in Hyderabad on the National Highway No. 7, near Kompally and started raising varieties of rose cultivars which he gathered from different sources. He started grafting roses on wild stock and selling them at very nominal prices to all the rose lovers of Hyderabad. He was an authority on roses and shared his knowledge with who ever had interest in growing roses. Students from agricultural colleges would visit Durga Nursery & Gardens as part of their field visits. He was a true Gandhian and led a life as one till 1984 when he passed away at the ripe old age of 94.

Sri Lakshminarayana was 70 years of age when he started the garden at Kompally. My grand mother, Smt Kameshwari, who was about 63 joined him. Both of them with their only child Ramakrishna Rao started the Kompally farm from scratch (clearing a scrub jungle in a completely god-forsaken place).

My father Ramakrishna Rao a Chemical Eng. from BHU and a Sugar Technologist quit his job in order to support his father's passion."

(Mr. Srinivas continues the horticultural tradition – he is a landscapist / nurseryman, keeping the same name Durga Gardens, in Hyderabad, and has instituted a Gold Medal in his grandfather's memory, to be awarded at the Hyderabad Rose Society's Rose Shows).

It was our good fortune that we came to become his good friends entirely by accident. In the mid-1960s we happened to live in Nizamabad (a district in the present Telengana State, but in those days a part of the state of Andhra Pradesh, where Viru was posted as District Collector). Viru's official work brought him to the capital, Hyderabad, every month. The road from Nizamabad to Hyderabad crosses the village of Kompally, (where Mr. Lakshminarayana's farm was located) at a slightly elevated point, and then coming down and straightening to a railway crossing, after which was the turning to the mud road leading to the farm. A panoramic view of the rose farm could be had from the elevated point of the road – an astonishing blaze of colors. On our first trip to Hyderabad, from Nizamabad, we were so amazed to see this sight that we could not help but barge in, unannounced, to meet the owner of this fascinating place. Mr. Lakshminarayana, came out of his little thatched hut and greeted us with affection, though we were complete strangers. He was a very tall and well built, stalwart gentleman, very straight-backed, and clad, as he always was, in pristine white khadi jubba (shirt) and dhoti. Of course the rose bond was obvious, and the bond became stronger each time we visited and spent hours walking around the farm. And we made it a habit to stop by, every month, on our journeys to Hyderabad. And in later years, when Viru was posted in Hyderabad itself, it became a tradition that every weekend, of a Sunday morning, we would drive down from our Banjara Hills house, to Kompally to meet the great man, and learn about roses from him. And we were delighted and privileged, when he began to visit our garden too, to see, advise, take cuttings, bud-wood and plants from us. And to see and comment upon Viru’s rose breeding programme.

Under his expert cultivation the display of roses was indeed astonishing. Even today, more than 50 years later, we still recall the glorious rose plants he grew – a long line of the famous early hybrid Tea, 'E. G. Hill', in shades of pink and red, with a glorious fragrance, was a standard feature of the garden.

Mr. Lakshminarayana devoted equal attention to the old stalwarts – the heritage roses, as well as the latest introductions. Great roses of the past, like the two incomparable Hybrid Perpetuals, 'Hugh Dickson' and 'George Dickson', were grown brilliantly, as also the still unbeatable climber, 'Maréchal Niel'. The sight of this rose, climbing a simple wooden structure in front of his house (which was, at first, just a thatched hut and which then became, over the years, a tiled roof house) with hundreds of golden flowers, remains etched in our memory.

Among the more modern roses were Hybrid Tea varieties like 'Mme. Charles Sauvage' (yellow), 'Montezuma' (orange), and 'Mr. Lincoln' (dark red), to name but a few of the many he acquired and grew to perfection. Many of the roses raised by India’s pioneering rose breeder B.S. Bhatcharji of Bhawan Bigha in Bihar State were also grown by him. As also the roses bred by Dr. B.P. Pal.

He also grew a wide variety of vegetables and other flowers. We can still visualize the many water lilies he grew. Age did not dim his passion and he could be seen, early in the morning and late in the evening, when it became dark, walking around his rose and other beds, making sure the bunds to irrigate the plants were in good order. His young (at the time we first encountered this remarkable rosarian, in the mid 1960s) helper was Jagan, who learnt all his skills of gardening from the master, and grew old in his company but well versed in all aspects of rose farming.

We cherish the memory of this remarkable man, with great affection and respect and are indeed honoured that he considered us his friends and his chelas. He richly deserves to be a source of inspiration for the young rose growers of Vijayawada and Andhra Pradesh.

Copies of the original

Indian Rose Annual 2018

Sri Mushti Lakshminarayana

A great horticulturist and rose grower of Vijaywada

Mr. Mushti Lakshminarayana

— Girija and Viraraghavan

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At the farm

Indian Rose Annual - IRA 2019

The Rose named for E. K. Janaki Ammal

Girija and M.S.Viraraghavan

Many of you may not have heard of the scientist E.K. Janaki Ammal. But if you are a plant breeder, interested in the genetics of plants, their chromosome numbers and their ploidy (diploid, meaning 2 sets of chromosomes, triploid, meaning 3 sets and tetraploids, meaning 4 sets) in order to make meaningful crosses, you would certainly know her name because for many decades she worked relentlessly in laboratories, poring over all plant species to work out their internal details. Her monumental work can be seen in the book she collaborated with Dr. C. D. Darlington titled Chromosome Atlas of All Cultivated Plants. The first edition was printed in 1945.This is referred to as a Bible among plant scientists.

E. K. Janaki Ammal was a brilliant cytogeneticist who battled great odds (she was a woman, an Indian of mixed heritage - of a so called ‘low’ caste of Kerala, but also with a grandfather who was an Englishman and a judge in British India - in the early 20th century) to achieve outstanding success in her field. Born in 1897, in Thalassery, Kerala, her judge father ensured she pursued her education ..and boy, did she do him proud.. a Bachelor’s and then a Master’s degree in Botany from Presidency College Madras in 1921 was followed by a Barbour scholarship for another Master’s degree at the University of Michigan USA in 1925. In 1931 Michigan University conferred an honorary doctorate (D.Sc. *honoris causa*) on her – she is still one of the very few Asian women to be so awarded.

Choosing a life of scholarship over marriage (unheard of in those times) she taught in Chennai and Trivandrum for some years before being chosen by Nobel laureate Sir C. V. Raman as a Research Fellow doing work on sugarcane in the newly established Indian Academy of Sciences. Her work on sugarcane, in Coimbatore, in the 1920s is well known. She worked with sugarcane species from other countries and our indigeneous varieties to create hybrids that made our sugar sweeter, and that would do well in all parts of India.

But gender and caste discrimination disgusted her and she left for England to join the famous John Innes Institute, Norwich, Norfolk, as a cytologist. Working there from 1940 to 1945 she braved wartime bombings on a daily basis, diving under her bed when the raids occurred and sweeping the broken glass in the office when she reported for work! Impressed by her dedication the Royal Horticultural Society invited her to join them in their gardens at Wisley near Kew. Here she met many world famous plant scientists, among them the biologist Dr. C.D. Darlington, who became her friend and mentor and with whom she authored The Chromosome Atlas. At Wisley she worked on the plant magnolia, and also planted many in the gardens, many still flowering today, including one named for her - *Magnolia kobus* ‘Janaki Ammal’.

Serendipitously, on a flight home to India, in 1948, she met the then Prime Minister, Pandit Jawaharlal Nehru, who was so impressed by her and her talents, that he invited her to return and head the newly formed Botanical Survey of India (BSI). She agreed and reorganised the office in Calcutta in the 1950s. Her interest in biodiversity and ecology took her to remote parts of the country, collecting indigeneous plants, many of medicinal value, folklore and tribal knowledge systems, incorporating them into the work of the BSI.

As an environmentalist she actively protested against projects like dams and hydroelectric projects, like in the Silent Valley in Kerala, which would be harmful. She worked at the Atomic Energy Station in Trombay and lectured at international symposiums. After retirement she became Emeritus Scientist in the Centre for Advanced Botany in the Madras University at Maduravoyal, just outside Chennai.

She was awarded the Padma Shri in 1977.

Janaki Ammal led an ascetic life, her focus entirely on her work. She died in 1984 at age 87.

In recognition of her outstanding work, the Government of India has instituted scholarships in her name.

In the U.K. too, The John Innes Institute has started the E. K. Janaki Ammal Scholarships for students from developing countries.

It is very sad indeed that this pioneering woman scientist is not much more well known than she is at present.

Coming back to her seminal work, the ‘Chromosome Atlas of Cultivated Plants’, we bought a copy as early as May 1966 when Viru was starting his rose breeding. Since he wanted to focus on rose species native to India, and he wondered how difficult it would be to breed with them, he pored over this book, checking out the ploidy of different rose species. Since he has been interested in breeding with other plants, like rhododendrons, magnolias and the Himalayan blue poppy (meconopsis), he refers often to this book, which we have had to rebind as the pages were coming apart!!

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Since we felt very strongly that enough recognition had not been given to this pioneering woman scientist of our country, who practically died in oblivion, despite her mammoth botanical research, we felt that we would like to honour her by naming a rose in her name, just as we have in the past been privileged to name roses for Sir George Watt, Sir Henry Collett and Frank Kingdon Ward (all of whom discovered *Rosa gigantea* in the wild), Dr N.C. Sen and Narender Singh for their help in reaching us plants *R. clinophylla* species, Leschenault de la Tour (who discovered *R. leschenaultiana* – belonging to the musk rose complex - in the Western Ghats) and also for many dear friends across the world.

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For those interested the parentage of this rose is:

'Landora' x ['Montezuma' x {'Little Darling' x (*R. clinophylla x R. Bracteata*)}]

It has been classified as a Grandiflora, yellow blend color, fragrant, a tall growing shrub, disease resistant and continuous flowering.

We had the pleasure of meeting Dr Vinita Damodaran in August 2018 in Pondicherry… she visits every year as she has an ancestral house in the French quarter, and getting to know her.

We have sent material of this rose for more plants to be propagated so that they can be planted in the gardens of the institutions she worked in - the John Innes Institute and the Royal Horticultural Society’s gardens in Wisley, and in the Botanical Survey of India’s gardens.

Copies of the original

Indian Rose Annual 2019

The Rose named for E K Janaki Ammal

-Girija and M.S.Viraraghavan

Many of you may not have heard of the scientist E.K. Janaki Ammal. But if you are a plant breeder, interested in the genetics of plants, their chromosome numbers and their ploidy (diploid , meaning 2 sets of chromosomes, triploid, meaning 3 sets and tetraploids , meaning 4 sets) in order to make meaningful crosses, you would certainly know her name, because for many decades she worked relentlessly in laboratories, poring over all plant species to work out their internal details. Her monumental work can be seen in the book she collaborated with Dr C D Darlington titled Chromosome Atlas of All Cultivated Plants. The first edition was printed in 1945.This is referred to as a Bible among plant scientists.

E K Janaki Ammal was a brilliant cytogeneticist who battled great odds (she was a woman, an Indian of mixed heritage-of the so called 'low' caste of Ezhavas of Kerala, but also with a grandfather who was an Englishman and a judge in British India - in the early

20th century) to achieve outstanding success in her field. Born in 1897, in Thalassery, Kerala, her judge father ensured she pursued her education..and boy, did she do him proud.. a Bachelor's degree, and then a Master's degree in Botany from Presidency College Madras in 1921 was followed by a Barbour scholarship for another Master's degree at the University of Michigan, USA in 1925.In 1931 Michigan University conferred an honorary doctorate (DSc. honoris causa) on her - she is still one of the very few Asian women to be so awarded.

Choosing a life of scholarship over marriage (unheard of in those times) she taught in Chennai and Trivandrum for some years before being chosen by Nobel laureate Sir C . V. Raman as a Research Fellow doing work on sugarcane in the newly established Indian Academy of Sciences. Her work on sugarcane, in Coimbatore, in the 1920s is well known. She worked with sugarcane species from other countries and our indigeneous varieties to create hybrids that made our sugar sweeter, and that would do well in all parts of India.

But gender and caste discrimination disgusted her and she left for England to join the famous John Innes Institute, Norwich, Norfolk, as a cytologist. Working there from 1940 to 1945 she braved wartime bombings on a daily basis, diving under her bed when the raids occurred and sweeping the broken glass in the office when she reported for work! Impressed by her dedication, the

Royal Horticultural Society invited her to join them in their gardens at Wisley near Kew. Here she met many world famous plant scientists, among them the biologist Dr C. D. Darlington, who became her friend and mentor and with whom she authored The Chromosome Atlas. At Wisley she worked on the plant magnolia, and also planted many in the gardens, many still flowering today, including one named for her-Magnolia kobus 'Janaki Ammal'.

Serendipitously, on a flight home to India, in 1948, she met the then Prime Minister, Pandit Jawaharlal Nehru, who was so impressed by her and her talents, that he invited her to return and head the newly formed Botanical Survey of India (BSI). She agreed and reorganised the office in Calcutta in the 1950s. Her interest in biodiversity and ecology took her to remote parts of the country, collecting indigeneous plants, many of medicinal value, folklore and tribal knowledge systems, incorporating them into the work of the BSI.

As an environmentalist she actively protested against projects like dams and hydroelectric projects, like in the Silent Valley in Kerala, which would be harmful. She worked at the Atomic Energy Station in Trombay and lectured at international symposiums. After retirement she became Emeritus Scientist in the Centre for Advanced Botany in the Madras University at Maduravoyal, just outside Chennai.

She was awarded the Padma Shri in 1977.

Janaki Ammal led an ascetic life, her focus entirely on her work. She died in 1984 at age 87.

In recognition of her outstanding work, the Government of India has instituted scholarships in her name.

In the U.K. too, The John Innes Institute has started the E K Janaki Ammal Scholarships for students from developing countries.

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Another great botanist, another great-niece and her rose ’Lady Jane Hooker’

Girija and M.S.Viraraghavan

The name J.D. Hooker (Joseph Dalton Hooker in full so it is not mistaken for his father, also a great plantsman) 1817-1911, needs no introduction to Indian plant lovers. He was a British botanist and explorer in the 19th century. He was a founder of geographical botany and Charles Darwin's closest friend. For twenty years he served as director of the Royal Botanical Gardens, Kew, succeeding his father, William Jackson Hooker, and was awarded the highest honours of British science.

He first came to India, to Sikkim State in 1847, spending 3 years exploring and plant collecting, despite great hardships, even being imprisoned by the king of Sikkim for trespassing. He was the first European to collect Himalayan plants. His ‘Himalayan Journals’ dedicated to Charles Darwin, was published in 1854. His greatest botanical writing was the Flora of British India (7 volumes) written from 1872 to 1897, and in 1904 he wrote “A Sketch of the Vegetation of the Indian Empire”.

The Kew Herbarium owes much to him.

The year 2017 was his Bi-centenary, and a year long exhibition on him, curated by Kew, was organised in the Botanical Survey of India Indian Museum in Kolkata.

In one of his Himalayan Journals, he writes:

“*On the 7th of May (1850), about 80 miles in a straight line from the foot of the Himalaya, we found the stratified sandy banks, which had gradually risen to a height of thirteen feet, replaced by the hard alluvial clay of the Gangetic valley, which underlies the sand: the stream contracted, and the features of its banks were materially improved by a jungle of tamarisk, wormwood (Artemisia), and* ***white rose bushes (Rosa involucrata****), whilst mango trees became common, with tamarinds, banyans and figs. Date and caryota palms, and rattan canes, grew in the woods, and orchids on the trees, which were covered with a climbing fern (Acrosticum scandens), so that we easily doubled our flora of the river banks before arriving at Maldah”*.

Rosa involucrata was the earlier name for *Rosa clinophylla*.

Now you will understand our preoccupation with Hooker and his writings – for, (apart from his horticultural knowledge which enabled him to identify a wide variety of plant species) in his Flora of British India Vol. 2, page 365, he writes, most cryptically indeed, of *Rosa involucrata,* 'collected by Munro in Mysore'. As you know Viru's rose hybridising has focussed on this rose species (apart from *R. gigantea*, and recently other species like *R. laevigata rosea, R. hirtula, R. chinensis spontanea*) and we have been collecting clones of this species from Bengal, Bihar and Rajasthan (Mt Abu). For the last many years we have been looking for this southern clone. 'Mysore' is a wide area, it could include all of the erstwhile Mysore State….. so far, despite our many forays to different areas of the region, we have been unsuccessful in our quest to locate this species in the wild.

A few years back, at a plant friend's home, we met his friend, Lady Jane Barran, and when, as happens with us, we began to discuss plants, she mentioned to us that she was a great niece of J. D. Hooker, expecting us to look blank. When, instead, we excitedly told her that we knew him well, in fact Viru had just written an article entitled 'Sikkim and its Rhododendrons – 161 years after J. D. Hooker' (for the 2011 Yearbook of the Rhododendron, Camellia and Magnolia group of the Royal Horticultural Society of the U.K.), had all his books on India and that we were hunting, from a reference he made, for a rose species, in Mysore, she was so taken aback that someone in India still knew of him, that she became teary eyed.

She has become a good friend, visiting us from the U.K, on a couple of occasions. When she came, in February 2018, with a large group of plant enthusiasts, our plant of (*R. longicuspis* x *R. gigantea*), was in full and exuberant bloom, scrambling over two very tall and wide trees, making a curtain of blooms 20 feet x 30 feet!! She fell in love with this and requested Viru, ''Could you possibly name it for me… as 'Lady Jane Hooker', my maiden name?'' This plant has been grown by us from open pollinated seeds we had got many years back (in 2000) from Barbara and Peter Knox Shaw's garden in Elgin near Cape Town, South Africa. When Becky and John Hook of Roseraie du Desert in southern France , visited us in 2008, they were struck by this plant too, and took cuttings - John has named it 'Kodaikanal'.

We happily agreed to Lady Jane's request, so now this inter-species crossed seedling is registered as 'Lady Jane Hooker' - a neat way to honour both the great botanist and plant explorer of the 19th and early 20th century to whom all Indian horticulturists should be grateful, and his charming great-niece.

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'Lady Jane Hooker' (2)

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'Lady Jane Hooker'

Indian Rose Annual - IRA 2019

John Sullivan and his rose

Girija and M. S. Viraraghavan

“Ooty is a beautiful jewel in the crown of India”

The name of this lovely hill station, in south India, called the ‘Queen of the Nilgiris’ may have changed from Ootacamund to Uthagamandalam, but everyone knows it by its shortened form, Ooty. But do you know the history of this once summer capital of what used to be the Madras Presidency of British India days? Ooty will celebrate its bicentenary in January 2019. The history of Ooty and modern Nilgiris (the name of the mountains in present day Tamil Nadu of the long Western Ghats range), began when Mr. John Sullivan, of the Indian Civil Service, the then Collector of Coimbatore District (of Madras Presidency) which included the Neilgherries, as the British called them, rode up the heavily forested mountains on horse-back, and reached the area which is now Ooty town, on January 4th 1819. Charmed by the scenery, which he described as resembling Switzerland, he set about, with an ‘extraordinary passion to promote the hills as a sanatorium’.

When I requested Mr. Dharmalingam Venugopal, a retired bank officer, who is a local, and a passionate history buff of these hills, and who runs the Nilgiri Documentation Centre - he has made the house where Sullivan first lived into a Sullivan Museum - he sent me this short note on Sullivan :

“John Sullivan (1788-1855) was an officer of the East India Company who served the Madras Civil Service. His eagerness to find a sanatorium on the hills of the Madras Presidency led to the establishment of the first Hill Station of the British Raj at Ootacamund or Ooty in the Nilgiri Hills in the early 19th century.

He not only created a space for British invalids to regain their health; he also recreated an ‘English’ space on the hills for the visitors to feel at home.

Sullivan was instrumental in introducing the English staples of tea, potato and cabbages on the Nilgiri hills and supplemented them with a wide range of English crops and fruits like oats, wheat, barley, beetroot, turnip, radish, strawberry, peach, pear and apple.

Sullivan set the trend to recreate the English cottages and gardens on the hills by introducing a host of English trees and flowering plants including oak, hemp, flax, vetch, lucerne, geranium, laburnum, heliotrope, violet, mignonette and, last but not the least, rose.

The many faceted contribution of Sullivan earned him the description of ‘a rare combination of a magistrate, meteorologist, entrepreneur, town planner, engineer, capitalist, farmer, churchman and protector of the poor”.

The Hill Station founded by Sullivan is approaching its bicentenary as one of the most sought after tourist centres of India attracting no less than three million visitors a year”.

In March 2018, Mr. Dharmalingam Venugopal called us up - we had known him from many years back, when he, as part of an environment society called ‘Save Nilgiris Campaign’ and we, as members of our local environment society, the Palni Hills Conservation Society, were all associated with the ‘Save The Western Ghats’ initiative, which had environment societies and well known environmentalists across all the states through which this great mountain range runs, associated with its conservation work.

Mr. Venugopal explained that as 2019 was Ooty’s bicentenary year, they were planning many events to celebrate the occasion, and events to honour Mr. John Sullivan. As he was a plant and rose lover, they thought it would be a nice idea to have a rose named for him. He wondered if we would be willing to consider having one of Viru’s hybrids so named. He left the choice of plant and colour to us. We were happy to accede to his request, and we took many walks around our garden, looking at the rose seedlings. One in good bloom caught our eye. It was one which had caught the eye of our rosarian friend from Ratnagiri, Mr. Anis Giniwale, when he had visited us a couple of years earlier. The plant was just outside our courtyard door leading to the rose garden, in front of a greenhouse, and, framed by the stone doorway, the rich, large purple flowers made a stunning sight. When Anis went up to the plant he was captivated with the fragrance of the blooms. He had asked us if it had a name, and we had said ‘No, just a code name’. ‘You should release it’ he advised us. But we had not, and it was still in the same place and with a beautiful flower on it, as we were doing our reconnaissance, and it seemed to be saying ‘Hey, how about me? I need to be named’. So we acquiesced to its entreaty, took photographs and sent them to Mr. Venugopal. He was delighted with the rich deep purple colour and huge size, and when we told him it that it had quite an intoxicating fragrance, he was even more delighted and insisted that this would do John Sullivan proud.

We sent off budwood to the Manager of the Centenary Rose Garden in Ooty and to Mr. Kasturirangan of KSG Roses in Bangalore. The plants are coming along, and hopefully, at the time of the celebration of the Bicentenary, ‘Rose Sullivan’ will be formally dedicated to the man whose name is synonymous with Ooty. Some of his descendants are expected to attend the function and we hope they will like this rose honouring their illustrious ancestor.

Unfortunately, the parentage of this rose is lost – it is a seedling of many years vintage.

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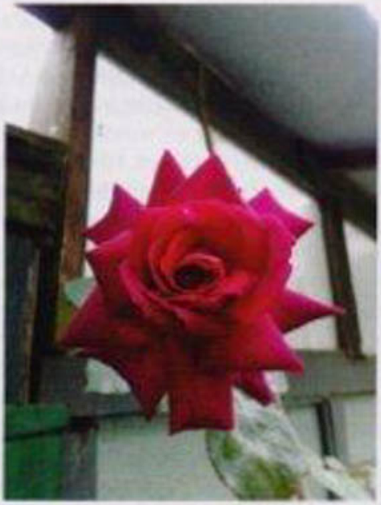
Mr. Venugopal explained that as 2019 was Ooty's bicentenary year, they were planning many events to celebrate the occasion, and events to honour Mr. John Sullivan. As he was a plant and rose lover, they thought it would be a nice idea to have a rose named for him. He wondered if we would be willing to consider having one of Viru's hybrids so named. He left the choice of plant and colour to us. We were happy to accede to his request, and we took many walks around our garden, looking at the rose seedlings. One in good bloom caught our eye. It was one which had caught the eye of our rosarian friend from Ratnagiri, Mr. Anis Giniwale, when he had visited us a couple of years earlier. The plant was just outside our courtyard door leading to the rose garden, in front of a greenhouse, and, framed by the stone doorway, the rich, large purple flowers made a stunning sight. When Anis went up to the plant he was captivated with the fragrance of the blooms. He had asked us if it had a name, and we had said 'No, just a code name'. 'You should release it' he advised us. But we had not, and it was still in the same place and with a beautiful flower on it, as we were doing our reconnaissance, and it seemed to be saying 'Hey, how about me? I need to be named'. So we acquiesced to its entreaty, took photographs and sent them to Mr. Venugopal. He was delighted with the rich deep purple colour and huge size, and when we told him it that it had quite an intoxicating fragrance, he was even more delighted and insisted that this would do John Sullivan proud.

We sent off budwood to the Manager of the Centenary Rose Garden in Ooty and to Mr. Kasturirangan of KSG Roses in Bangalore. The plants are coming along, and hopefully, at the time of the celebration of the Bicentenary, 'Rose Sullivan' will be formally dedicated to the man whose name is synonymous with

Ooty. Some of his descendants are expected to attend the function and we hope they will like this rose honouring their illustrious ancestor.

Unfortunately, the parentage of this rose is lost – it is a seedling of many years vintage.



Indian Rose Annual - IRA 2020

INTREPID ROSES

HOW ROSES REACHED INDIAN GARDENS BY PERILOUS PATHS, TREACHEROUS SEAS, SWAMPS AND HIGH MOUNTAINS

Girija and M. S. Viraraghavan

India, often referred to as the' Indian sub-continent', has a climate influenced greatly by

1. The Himalayas, the world's highest mountain range, which, effectively prevents cold air from Central Asia reaching the country, and
2. The two monsoons – the South West Monsoon (June to September) where most of the rain falls over large parts of the country, and the North east monsoon, (October to December) which covers the southern part of the eastern peninsular coast.

Why do we refer to roses which came into India as intrepid roses? This is for the simple reason that the two entry points to India through the Himalayan mountains in the north, and the oceans around the coast - the Bay of Bengal on the east and the Arabian Sea on the west, were indeed difficult, even hazardous points for the entry of roses, which our researches show was much earlier than previously reckoned.

Access through the Himalayas was feasible only through 2 passes – the Khyber Pass and the Bolan Pass, which lie on the border between Afghanistan and present day Pakistan - this was the trade route through which roses must have arrived. This route would have been connected to China and further east through the famed Silk Road, which was a most romantic but tremendously dangerous access, dominated as it was by violent tribesmen often at war with each other. This is the area of the world's fastest horses and the fiercest conquerors - Genghis Khan and Tamarlane to name but two.

The seas in those days - pre Christian era - were hardly of easier access as the monsoon winds and the frequent storms called cyclones, made sea voyages very difficult indeed for the sailing ships of yore.

It is therefore quite amazing that the love of the rose overcame such dangers, and roses reached India and the rest of the world carried by intrepid adventurers. Hence, intrepid roses.

A few words on India’s wild roses. As mentioned earlier, the Himalayas moderate the country’s climate with the result that areas on the plains have a much warmer climate than other places at the same latitudes across the northern hemisphere. Consequently, our wild roses are confined to the higher reaches of the Himalayas, including the mountains in the north East on the border with Myanmar. There are over 8 endemic rose species in the Himalayas and if we include their eco-types, the numbers increase to many more. Apart from endemic species, there occur here a number of wild roses which have migrated both from the east and west - from China and further east as well as Iran and further west.

On the plains of the Indian mainland the only species present is that remarkable tropical rose, *R. clinophylla*, about which we will speak later.

The highest areas - above 1500 meters elevation - of the Western Ghat mountains of south India are home to that largest flowered of all musk roses, *R. leschenaultiana*.

We now come to the focus of this talk - how different heritage roses and species entered India over the centuries by land and sea. The crucial point we would like to emphasize is that the arrival of these roses occurred substantially earlier than what was thought before, with the discovery of the Sintra Prashasthi or stone tablet, dating to 1287 C.E. This tablet, which presently is lodged in a heritage property in Sintra, near Lisbon, Portugal, was originally erected in the temple of Somanatha, in western India, a temple which is now under the sea. The tablet, which is an edict of a king in the region, commands the gardener’s guild to supply 200 white roses and 2000 white oleanders to the temple every day of the year in return for which the guild would be granted lands. Such white roses which could flower throughout the year could only have been a Chinese rose - as you know, the quality of continuous flowering was the gift of China to the world of roses. These roses must have been growing in western India for quite some time at the time of the edict. We speculate that they would have arrived from China through the Silk Road. As our map shows the Silk Road refers both to the land route as well as the sea route from the east to Two Portuguese travellers, Domingo Paes and Fernando Nuniz, write about the king being garlanded with white roses and his palace being decorated with white roses during a festival called Dasehra, which falls in October every year. Surely this must have been a repeat flowering rose? Vijayanagar was no ordinary city in those days. It was described as being larger than Rome by the Portuguese traveller Duarte Barbosa.India and further west to the Middle East and Europe.

We visited Sintra some years back to view the tablet - it was indeed ancient, the words written in Sanskrit, the language of ancient India. But we hasten to clarify that the date of the tablet 1287 C.E. is the only direct evidence we have as of now of the date of arrival of roses into India. Surprisingly enough, another (or is it the same?) repeat flowering white rose appears in another part of India. We are now talking of Vijayanagar, the capital of the great empire of the same name which ruled south India between 1300 and 1500 CE.

Earlier we had mentioned about the Sintra Portugal tablet white roses having probably arrived through the Silk Road. Clearly many more roses came to India through this same route because another traveller Rashid-ud-din, around 1300 C.E. talks of the people of Gujarat, in the west of India, being very fortunate to grow more than 60 kinds of roses.

Going to south India again, to the west coast, we have the narrative of Ludovico Varthema, in 1503 C.E., to the effect that the people of the area around Calicut, grow roses in white, pink, red and yellow. How did so many roses reach this location? Clearly it must have been through a sea route. Speculating again, there is ample evidence of Chinese ships calling at Calicut port, including the fleet of that great admiral Zheng He. Indeed, he is reputed to have died in Calicut in 1433 C E. Chinese galleons often carried pots of roses on board to remind the sailors of their homeland. It is thus quite possible that roses in different colours reached India's west coast in this manner.

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Coming to the Mughal Empire era - 1500 C.E. onwards, the first Emperor of this dynasty, Babur, in his autobiography entitled Baburnama, talks of introducing the musk rose from Persia (Iran) into India, along with the narcissus. Babur had his roots in Central Asia, and the musk rose he refers to is *Rosa glandulifera*, now *Rosa moschata nastarana*, the Persian form of the musk rose.

There are no further references to rose introductions during the Mughal period of Indian history though all the emperors and their courts were garden lovers and established many gardens of roses and other plants. There is however an interesting story of this time - the discovery of rose oil, called attar, by the Empress Nur Jehan wife of the Emperor Jehangir in the 1600's. Whilst immersed in her bath of hot water scented with fragrant rose petals, she saw an oily fragrant substance floating on the water surface. This was rose oil called 'attar' which became the base of many scents and was widely used in Indian cuisine. Rose water is said to have been discovered during early Buddhist times, and is mentioned in Ayurveda texts.

What was this rose that Nur Jehan scented her bath with? Much later when roses were commercially cultivated for extraction of rose oil, in places like Ghazipur, Kanauj and other areas of north and east India, the rose used was *R. damascena bifera*, the Autumn Damask. Since this rose is also of Persian or Middle Eastern origin, it is reasonable to conclude that this too was brought from Persia by the Mughal dynasty. The Mughal Empire included the region of Kashmir, which lies immediately adjacent to Afghanistan, and in the mountains of Kashmir, we have the typical roses of Persia (Iran) – the two golden roses species – *R. foetida* and *R. ecae.* And they still grow there today.

The end of the Mughal period.. mid 18th century marks the start of the British rule of India, first as a trading company, the East India Company and late, from 1850s, directly by the British Government.

The British love of roses is well known and regular imports of roses and other plants commenced quite early; mostly from China, particularly from the port town of Canton, now Guangzhou. Even when the roses imported were meant to reach Britain, the ships would stop over in Calcutta, then the capital of India and a big port on the east coast, and the plants would be unloaded to have a rest cure, before continuing their journey. Transporting plants became much easier with the invention of the Wardian case.

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William Roxburgh wrote ‘Flora Indica’ in which he mentions the roses growing in India and particularly in the botanic garden in Calcutta. Many are clearly of Chinese origin, in fact he gives the name of two roses with their Chinese names. Both in his research station in Samalkot, much to the south of Calcutta, on the east coast, and in the Calcutta Botanic Garden, Roxburgh even had Chinese gardeners to look after his plants.

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There are various theories about the origin of 'Rose Edward', but the majority of experts believe that this variety arose in the Indian Ocean in the island of Reunion, which was, and continues to be a French territory. It lies between Madagascar and Mauritius. Sometime around 1820, the then Superintendent of the botanic garden in Reunion, M.Perichon, noticed a very fragrant repeat flowering rose. His opinion was that it was a natural cross between the China ‘Old Blush’ and the Autumn Damask rose, which were planted close together to form hedges for agricultural fields. He sent plants and seeds of this cross to France where it was identified as a new rose and named 'Rose Edouard'.

How did this rose from Reunion reach India, which is quite a distance away, so as to be so widely cultivated in the Cauvery area quite early on and then spreading all over the country? There is, therefore, another school of thought which believes this to be a rose of the Indian region based on the fact that it was cultivated on such a large scale so soon after the hybrid from Reunion was identified. Did it travel from India to Reunion?

Another heritage rose is again widely used for making garlands. We have identified it with the study name ’Kakinada Red’, Kakinada being the name of a port town on the eastern coast between Calcutta and Madras (now Chennai). This is again a Bourbon with a very sweet fruity fragrance with hints of apple, quite different from the damask fragrance of 'Rose Edward'. DNA studies done in Canada have shown that this rose is the same as the one called ’Pacific’ in Bermuda and ‘Maggie’ in southern USA, and all of these have close links to a rose called ‘Julius Fabianics de Misefa’ which was bred by the Hungarian rose breeder, Rudolf Geschwind in late 18 90s . If 'Kakinada Red' is actually a Geschwind rose it is indeed surprising that it seems to have reached India almost immediately after being bred. Its occurrence in Bermuda and the US is equally surprising. Professor

Wang Guoliang however feels that this rose came from China and is known as ‘Baoxing’ there.

Another Geschwind rose, ’Gruss an Teplitz’ has been grown all over north India on a large scale. Its appearance in such large numbers from the earliest times is again quite surprising.

We now come to an even more mysterious and unidentified rose, our study name for it being ‘Telengana Pink’ for the place where we first found it in the 1960s.This rose is very much a China with typical habit of growth bearing light pink flowers with beautiful Hybrid Tea form at bud stage. Our travels within India show that it grows over an extraordinary range – the courtyards in the wooden palace of the erstwhile kings of Travancore in the extreme south to many areas in peninsular India, including Telengana, in central India near the Kanha Tiger Sanctuary. We also found it in Thailand in the Petchaboon hills. None of the world’s rose experts have been able to identify this rose. Nor does anyone have a convincing explanation for its occurrence in south Asia.

Now to our favourite species rose.. probably the only tropical species in the world – *Rosa clinophylla*, found in the most exotic locations in India and Bangla Desh – in the ‘jheels’ or lakes of Bengal and Bangla Desh, on the banks of forest streams of central India, and on the isolated mountain top, Mount Abu, in the desert of Rajasthan in western India. It was reported by British botanists to have been seen in the south too.

The discovery of this amazing species was made in the mid 1800s, in British Indian times, by a Mr Rose, Superintendent of Post Offices whose jurisdiction was Bengal and Bangla Desh which was then part of India. His only means of travel during the flood season was by boat, on rivers and lakes, and once while doing so, he found this rose coming out of the water. Specimens sent ,to M.Crepin the taxonomist in Belgium, were identified as *Rosa involucrata*, later renamed *Rosa clinophylla*.

We must mention that, in the 1980s, when we searched for this rose to begin our hybridisation to create warm climate roses, there was only one plant in cultivation in Bengal, the region where in earlier years it was said to be easily found, growing wild and in plenty.

In conclusion, we would like to emphasize that the near loss of this unique rose species emphasizes the need for urgent conservation steps around the world for the preservation of rose species. Along with other plants, roses are gravely threatened by climate change and many areas of their habitat are being developed. In this situation, ex situ conservation in botanical gardens of different climates becomes vitally important. It is most unfortunate that precisely when such ex situ conservation is urgently required that export regulations on plants in the world have become even more rigid. Even world famous research institutions are unable to get plant material for research and conservation. This problem needs the serious attention of WFRS and botanical gardens of the world.

Text of talk given at Nanyang China, May 2019 at the Regional World Rose Conference

Copies of the original

Indian Rose Annual 2020

Intrepid Roses

How Roses Reached Indian Gardens By Perilous Paths, Treacherous Seas, Swamps And High Mountains

Girija and M.S.Viraraghavan
veerugi9517@gmail.com

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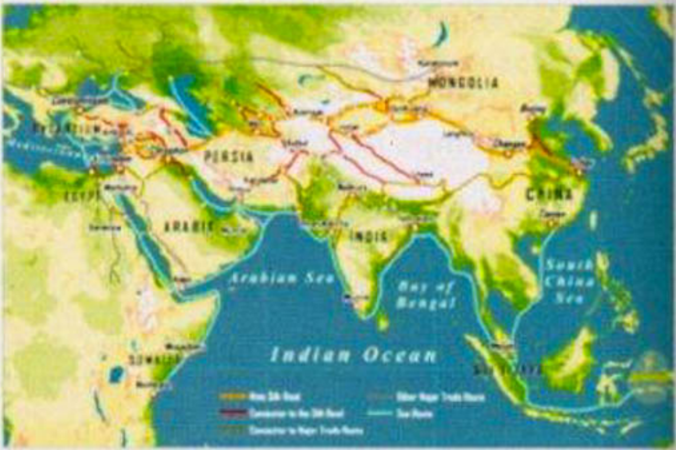

Silk road

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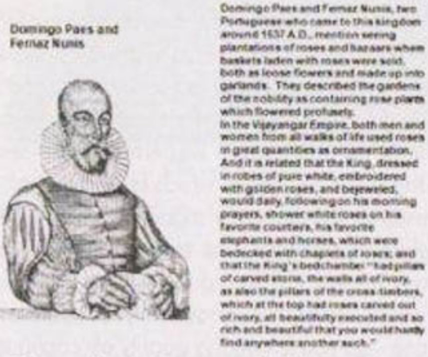

Domingo Paes and Fernaz Nunis

Domingo Paes and Fernaz Nunis, two Portuguese who came to this kingdom around 1537 A.D., mention seeing plantations of roses and bazaars where baskets laden with roses were sold, both as loose flowers and made up into garlands. They described the gardens of the nobility as containing rose plants which flowered profusely.

In the Vijayangar Empire, both men and women from all walks of life used roses in great quantities as ornamentation. And it is related that the King, dressed in robes of pure white, embroidered with golden roses, and bejewelled, would daily, following on his morning prayers, shower white roses on his favorite courtiers, his favorite elephants and horses, which were bedecked with chaplets of roses; and that the King's bedchamber "had pillars of carved stone, the walls all of ivory, as also the pillars of the cross-timbers, which at the top had roses carved out of ivory, all beautifully executed and so rich and beautiful that you would hardly find anywhere another such."

Observation on Roses recorded by Domingo Paes and Fernaz Nunis

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Babur

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Babur inspecting the making of garden

There is however an interesting story of this time—the discovery of rose oil, called attar, by the Empress Nur Jehan wife of the Emperor Jehangir in the 1600's. Whilst immersed in her bath of hot water scented with fragrant rose petals, she saw an oily fragrant substance floating on the water surface. This was rose oil called 'attar' which became the base of many scents and was widely used in Indian cuisine. Rose water is said to have been discovered during early Buddhist times, and is mentioned in Ayurveda texts.

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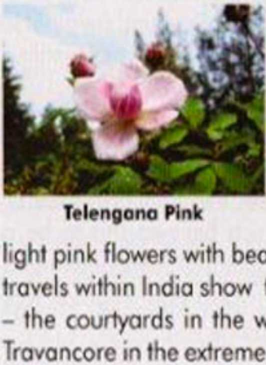
Another heritage rose is again widely used for making garlands. We have identified it with the study name 'Kakinada Red', Kakinada being the name of a port town on the eastern coast between Calcutta and Madras (now Chennai)

Kakinada Red

This is again a Bourbon with a very sweet fruity fragrance with hints of apple, quite different from the damask fragrance of R. Edward. DNA studies done in Canada have shown that this rose is the same as the one called 'Pacific' in Bermuda and 'Maggie' in southern USA, and all of these have close links to a rose called 'Julius Fabianics de Misefa' which was bred by the Hungarian rose breeder, Rudolf Geschwind in late 18 90s . If Kakinada Red is actually a Geschwind rose it is indeed surprising that it seems to have reached India almost immediately after being bred. Its occurrence in Bermuda and the US is equally surprising. Professor Wang Guoliang however feels that this rose came from China and is known as 'Baoxing' there.

Another Geschwind rose, 'Gruss an Teplitz' has been grown all over north India on a large scale. Its appearance in such large numbers from the earliest times is again quite surprising.


Telengana Pink

We now come to an even more mysterious and unidentified rose, our study name for it being 'Telengana Pink' for the place where we first found it in the 1960s.

This rose is very much a China with typical habit of growth bearing light pink flowers with beautiful Hybrid Tea form at bud stage. Our travels within India show that it grows over an extraordinary range – the courtyards in the wooden palace of the erstwhile kings of Travancore in the extreme south to many areas in peninsular India, including Telengana, in central India near the Kanha Tiger Sanctuary. We also found it in Thailand in the Petchaboon hills. None of the world's rose experts have been able to identify this rose. Nor does anyone have a convincing explanation for its occurrence in south Asia.

Now to our favourite species rose, probably the only tropical species in the world – *Rosa clinophylla*, found in the most exotic locations in India and Bangla Desh – in the 'jheels' or lakes of

Bengal and Bangla Desh, on the banks of forest streams of central India, and on the isolated mountain top, Mount Abu, in the desert of Rajasthan in western India. It was reported by British botanists to have been seen in the south too.

Rosa clinophylla Bengal form sent by Dr.Sen

The discovery of this amazing species was made in the mid 1800s, in British Indian times, by a Mr Rose, Superintendent of Post Offices whose jurisdiction was Bengal and Bangla Desh which was then part of India. His only means of travel during the flood season was by boat , on rivers and lakes, and once while doing so, he found this rose coming out of the water. Specimens sent to M.Crepin the taxonomist in Belgium, were identified as Rosa involucrata, later renamed Rosa clinophylla.

We must mention that, in the 1980s, when we searched for this rose to begin our hybridisation to create warm climate roses, there was only one plant in cultivation in Bengal, the region where in earlier years it was said to be easily found, growing wild and in plenty.

In conclusion, we would like to emphasize that the near loss of this unique rose species emphasizes the need for urgent conservation steps around the world for the preservation of rose species. Along with other plants, roses are gravely threatened by climate change and many areas of their habitat are being developed. In this situation, ex situ conservation in botanical gardens of different climates becomes vitally important. It is most unfortunate that precisely when such ex situ conservation is urgently required that export regulations on plants in the world have become even more rigid. Even world famous research institutions are unable to get plant material for research and conservation. This problem needs the serious attention of WFRS and botanical gardens of the world.

■■■

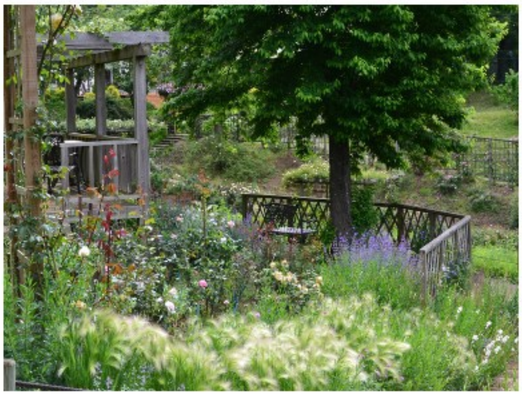
VARIETY IS THE SPICE OF ROSES

Girija and M. S. Viraraghavan

A presentation held 2019 in China and Japan

Variety is the spice of life… and of roses too. A rose garden is so much more attractive if it contains various kinds of roses. This is easily possible since the genus Rosa contains so much of variation – so many different kinds of roses that it is not difficult at all to make a very attractive garden utilizing this diversity. You may have noticed how people otherwise interested in gardening run down roses under the mistaken impression that they are temperamental, that the habit of growth is too stiff to fit in with other plants and that they are too much trouble to look after. Each of these assumptions is incorrect but we have to admit that we rose growers are partly responsible for not pointing out the landscaping possibilities with other plants in even the smallest rose garden. The rose may be the Queen of Flowers, but the Queen requires courtiers!

Traditional rose gardens emphasized the earlier accepted idea that roses should be grown in exclusive large sized rose beds, preferably rectangular or square shaped. To the non-rose person this is anathema. In the modern garden where space is limited, the garden lover likes to grow many different plants, including roses and we should fall in with this trend.



Sakura Heritage Rose Garden

Akao Garden

When you think of beautiful ways to combine companion plants with roses we should remind ourselves that we are sitting in one such garden – the Sakura Rose Garden itself, winner of the WFRS Award of Garden Excellence.

One more example is the Akao Garden, where we saw, on an earlier visit, how imaginatively rose diversity had been combined with the beauty of other plants. There were roses with bonsai, roses with those very beautiful bell flowers, platycodon, roses with so many other diverse herbaceous perennials and annuals. There are some disturbing reports that the maintenance of this beautifully landscaped garden has received a setback in recent times. All of us, Japanese rose and plant lovers, and others, should request the owners to set matters right, stressing the point that this garden is a national treasure and one which has won the Award of Garden Excellence from the WFRS.

Miniature rose, shrub rose, HT rose, Floribunda

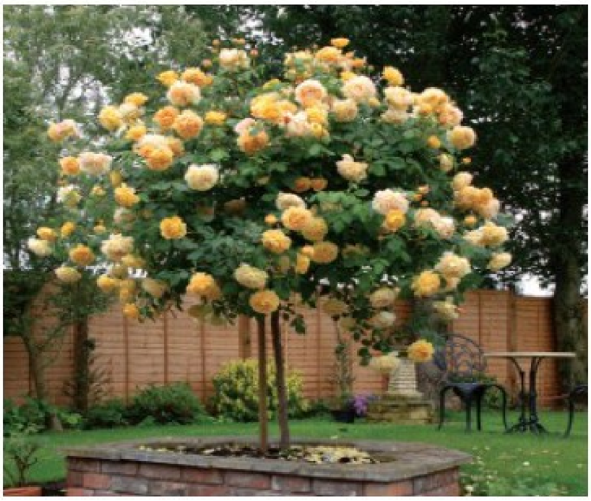
What is this rose diversity I am talking about? If you think about it, it is indeed incredible that there are so many different rose plant forms - there are roses which are miniatures, there are roses which are shrubs, we have the solitary giant flowered Hybrid Teas, and the clusters of the floribundas, the charm of the standards, the beauty of pillar roses, the grace of climbing roses, and the simplicity of the single roses. Within each category there is so much of difference, in colour and shape of flowers, the period of bloom, the foliage, even the prickles and the fruit. And we have to take full advantage of this fascinating profusion of qualities.

Miniature – Magic Carrousel

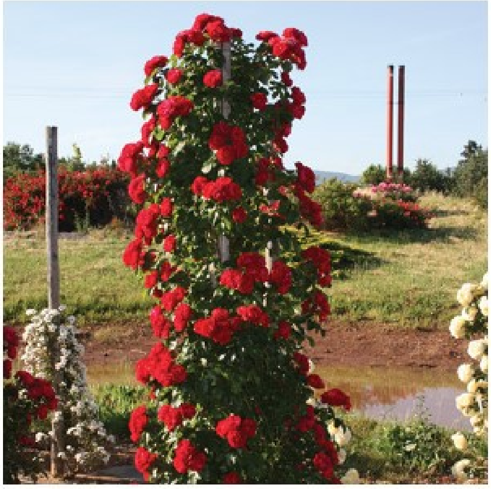
Hybrid Tea - Anna Pavlova

Shrub Rose – Belinda's Dream

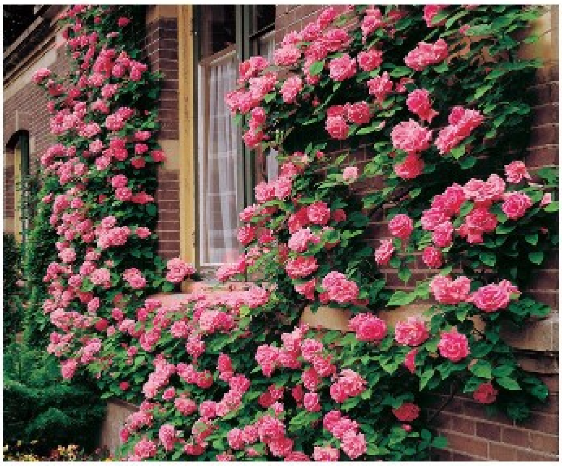
Floribunda - Cinco de Mayo



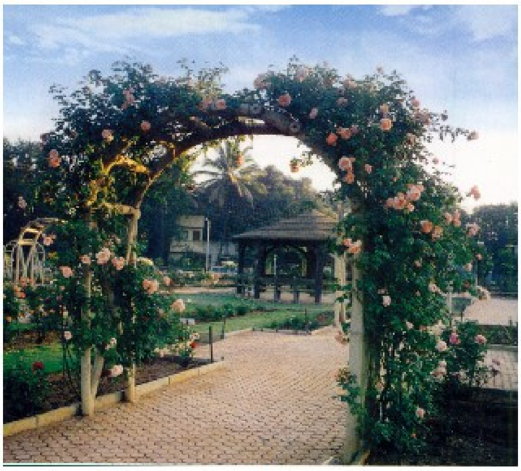
Standard Rose



Pillar **Rose**



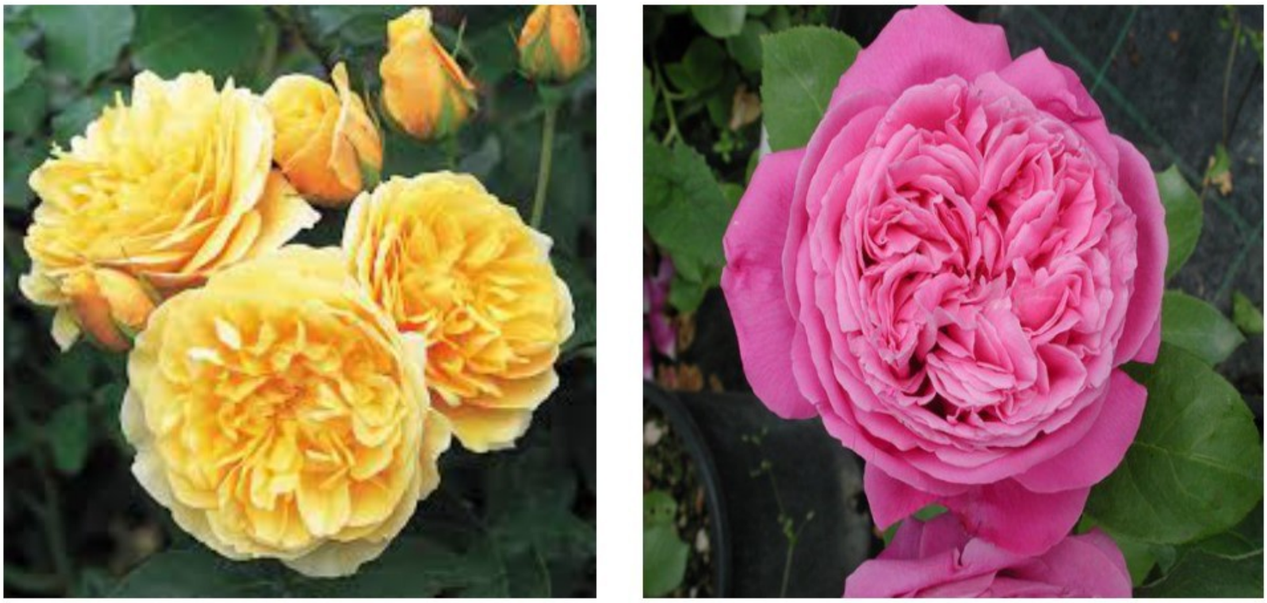
Climbing Rose



Rose Arch
“Kanyakumari” (Viru)

I would like to stress on the variety of flower form, not just plant form, available in the rose family. We have most prominently the Hybrid Tea form, with which all are familiar. A surprising fact is that this H.T. form is the gift of the species, *R. gigantea* to the rose world. More on this later.

The next important class is what called the old rose form – the form of the roses which our grandmothers grew. The old rose form has significantly gained in popularity, thanks to the pioneering work of David Austin of English Roses fame - sadly he passed away recently. But from ancient times this form has been the hallmark of roses.

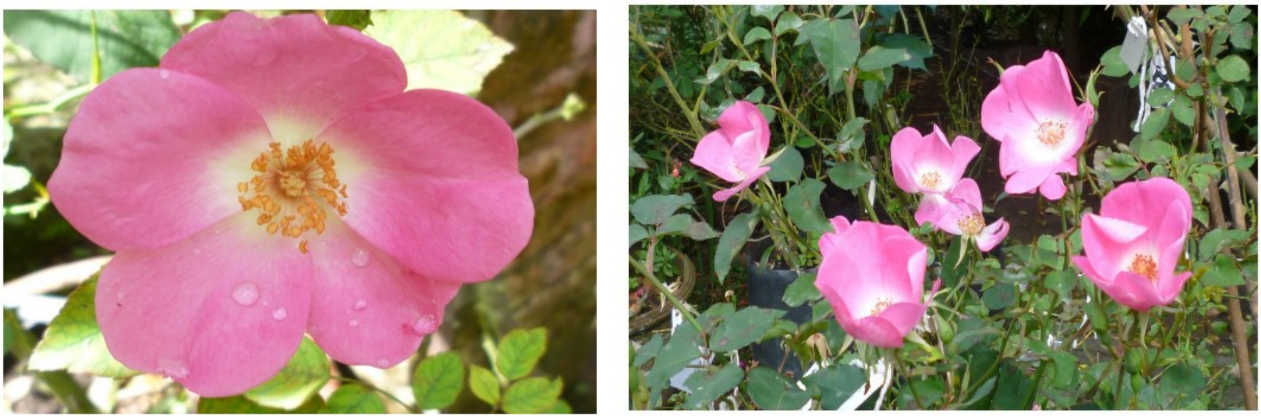


“Graham Thomas” “Paul Neyron”

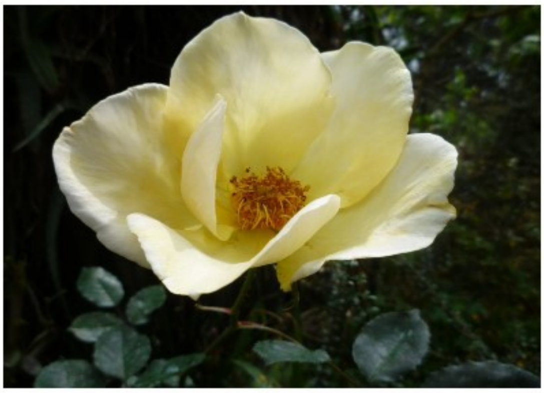
Old rose forms

Single roses

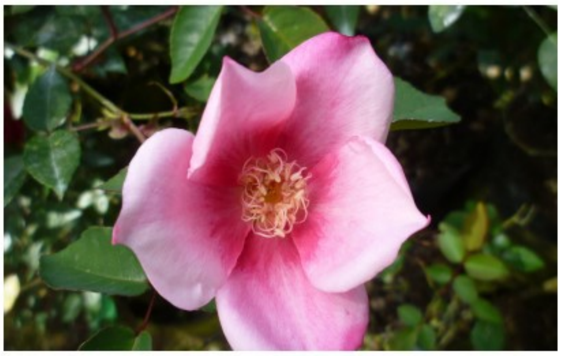
One other form is of course the single rose. As you know all wild roses have this form and we should appreciate the simple artistry of God’s own creation. Often, to my chagrin, I hear people remark, that the single rose does not look like a rose at all. On the other hand as we progress in our aesthetic appreciation of roses we soon realize that the single rose is indeed a hallmark of the beauty of the rose.



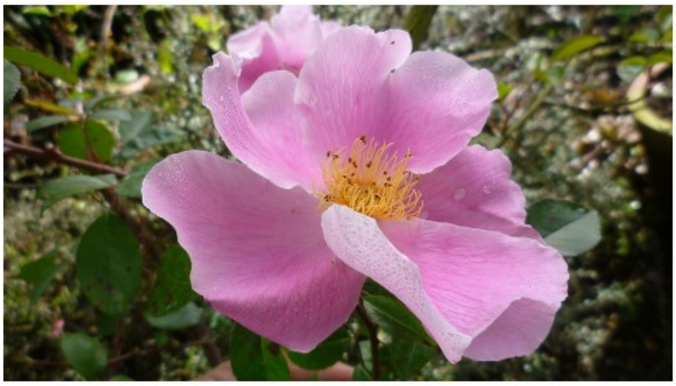
“Rose Legend Akira Ogawa”
(Viru)



“Lanjique Rose”
(Viru)

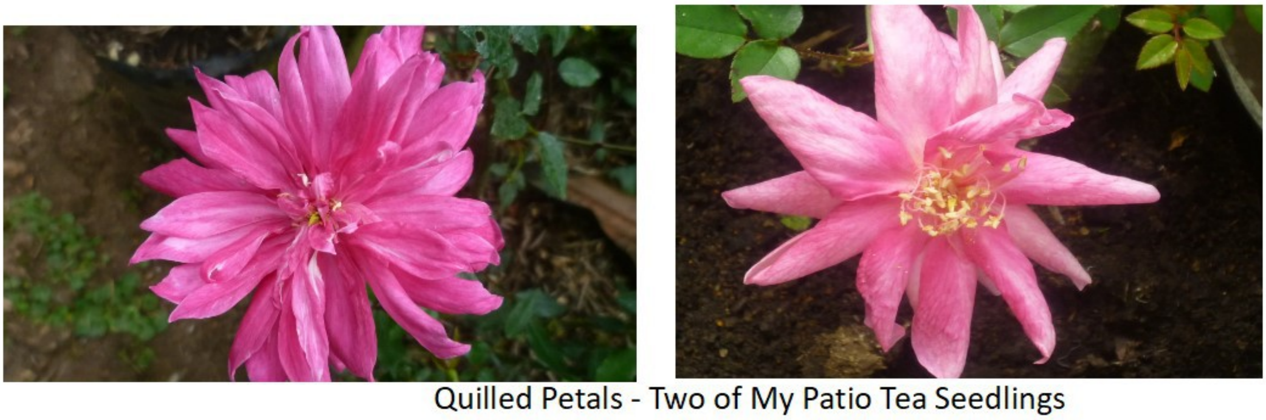


“Spot On “
(Viru)

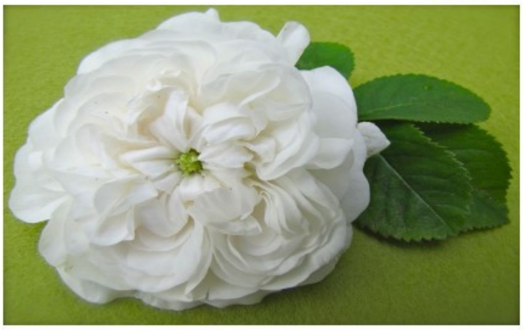


Laevigata Rosea

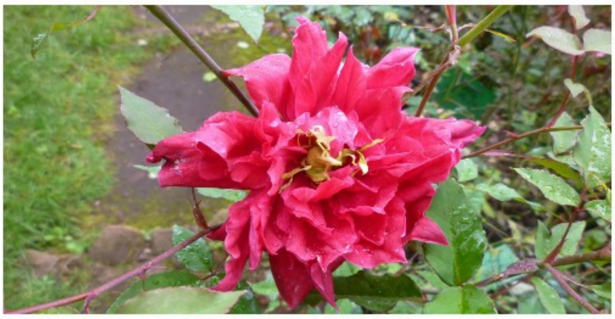
There are many other forms - for example, we have roses with quilled petals, roses with green (vegetative) centres, and roses which resemble other flowers, for example, chrysanthemums. But I leave it to you rose lovers to seek out thesedifferent kinds of rose forms. The exercise will give you great pleasure.



Quilled Petals - Two of My Patio Tea Seedlings



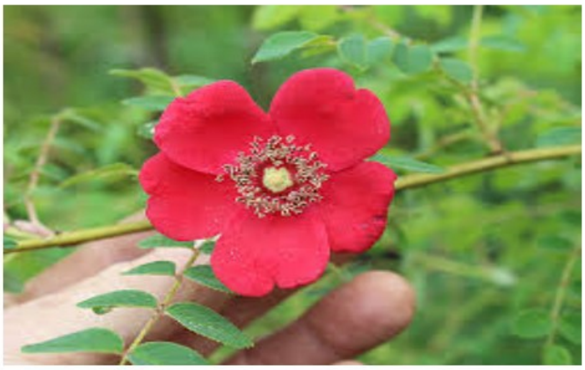
Madame Hardy - Green Centre



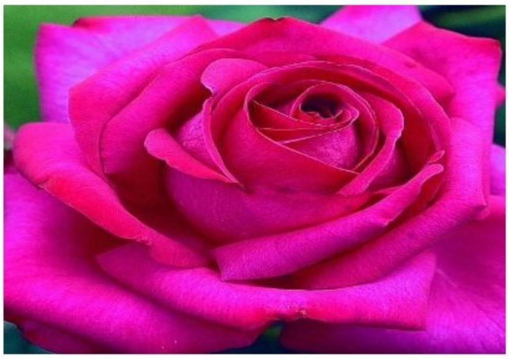
Ganges Nymph (Viru) - Quilled Petals & Green Centre

To my mind one of the most fascinating aspects of the rose is the extraordinary colour range unmatched perhaps in any other genus of ornamental plant, and of these the most romantic surely is the red rose, the symbol of love. Some of you may have heard of the great poem by Robert Burns, the Scottish poet: ‘My love is like a red, red rose’.

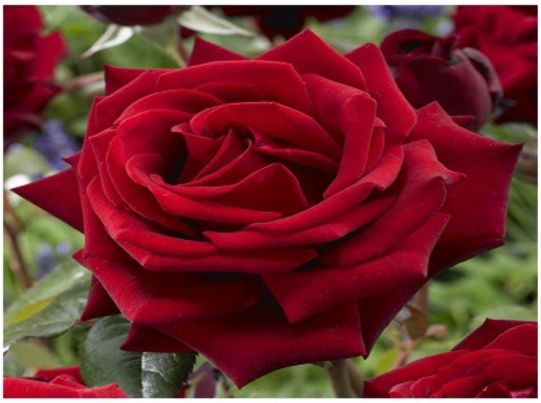
Before we come to red roses, a few words on the pigments responsible for rose colours. Basically, there are two types of pigments in the rose family – the first group, all water soluble, are the anthocyanins, and the closely related flavonols, which account for a range of colours from shades of pink to red as well as white and cream. The other main group are the carotenoids, water insoluble, which are responsible for the shades of yellow to orange. Carotenoids are named after the colour of carrots. The introduction of carotenoids around 1910 (‘Soleil d’Or’) in the blood line of roses was the single major step which resulted in the dazzling rose colours of today.



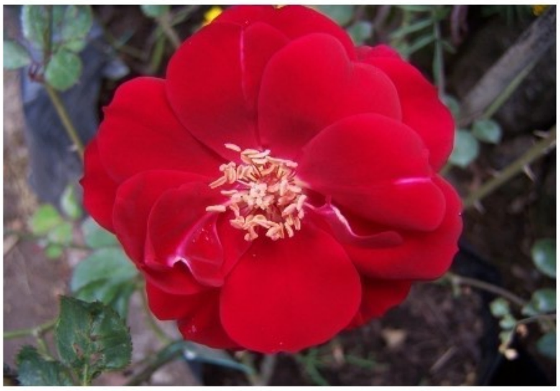
Rosa moyesii



”Parole “



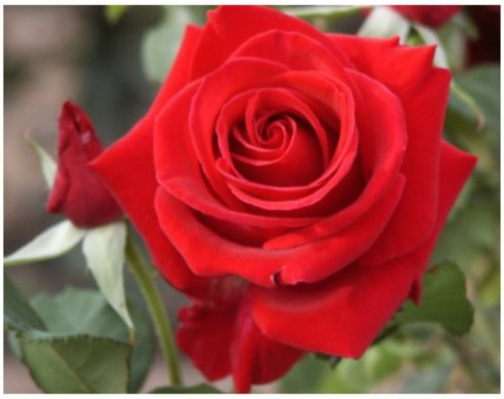
“Mr.Lincoln “



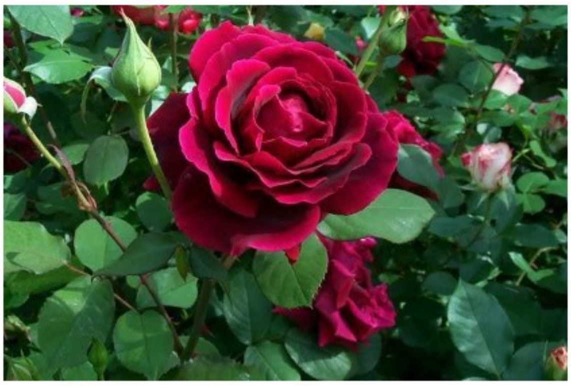
“Out of India “ (Viru)

Red roses

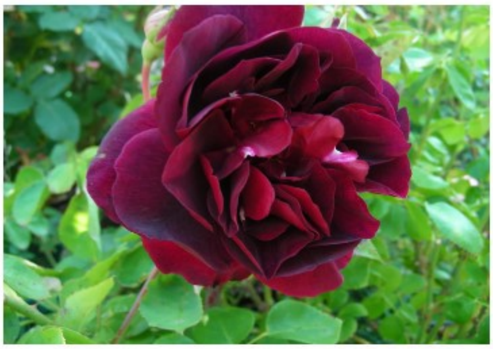
Coming back to red roses, there is a breathtaking range available. We have roses in light red, magenta red, pure red, red with dark crayoning, which is the connoisseur’s choice, and very dark almost black shades where there is a high concentration of pigments. I show you a representative group.



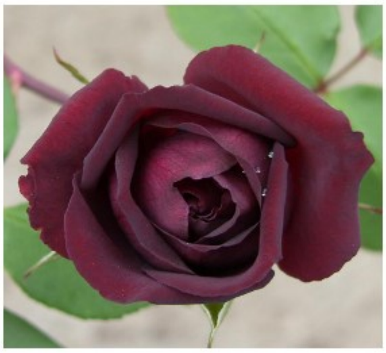
“Veterans Honor”



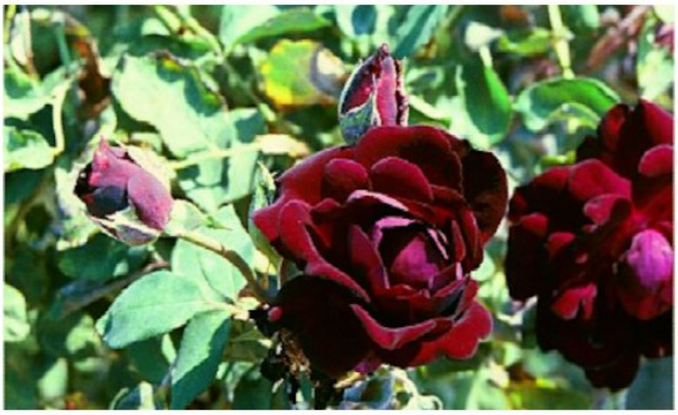
“Crimson Glory”



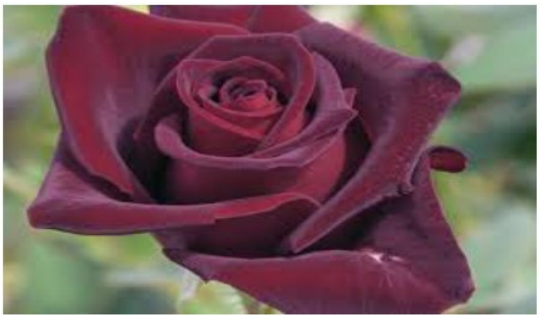
“Senegal”



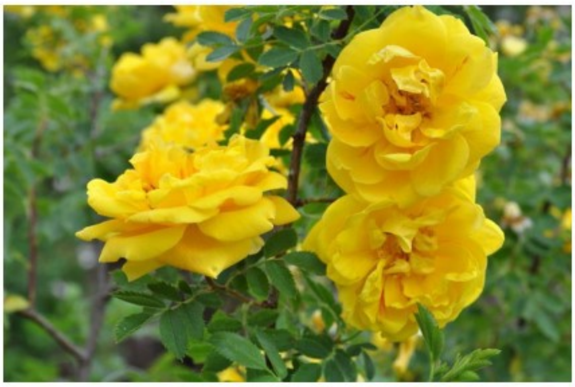
“Louis XIV”



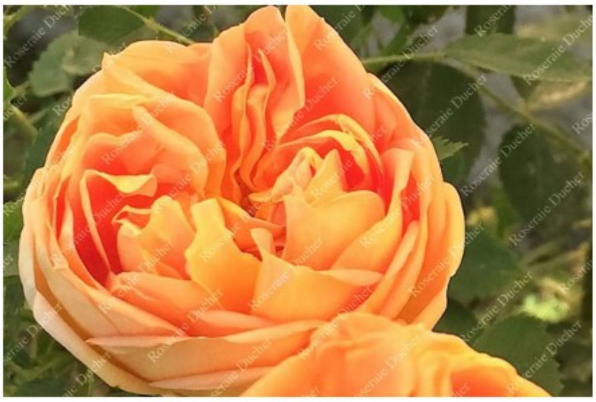
'Nigrette'



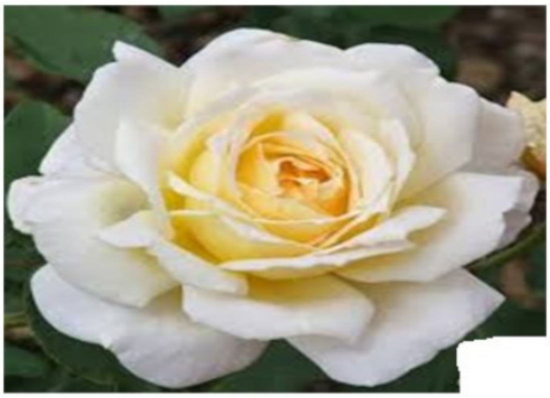
'Black Baccara'



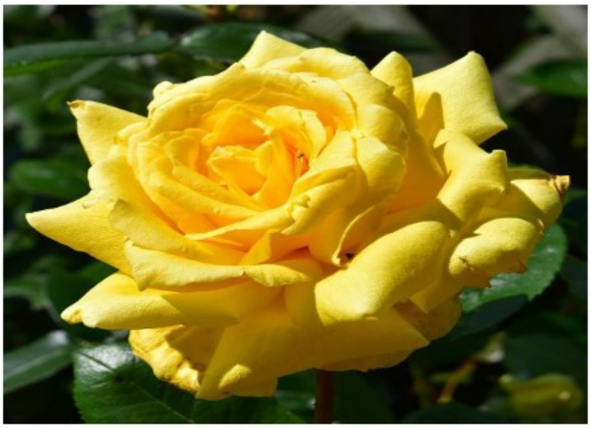
Rosa foetida Persiana



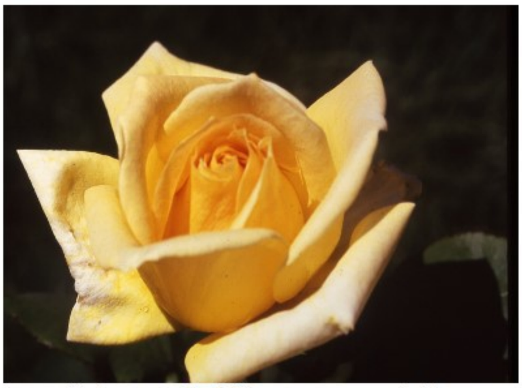
"Soleil d' Or"



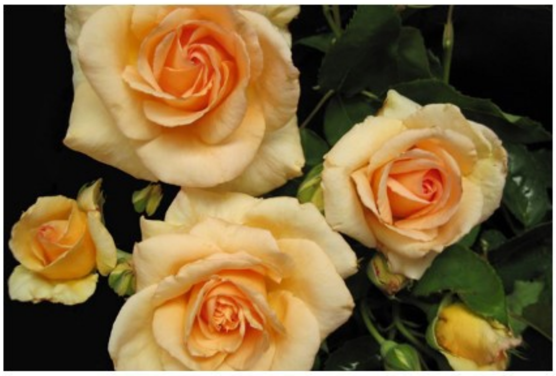
"Lemon Spice"



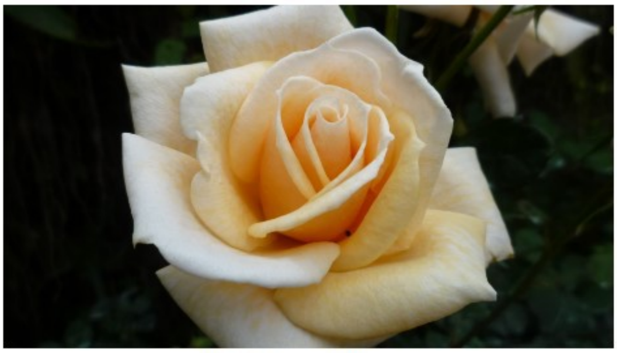
"King's Ransom"



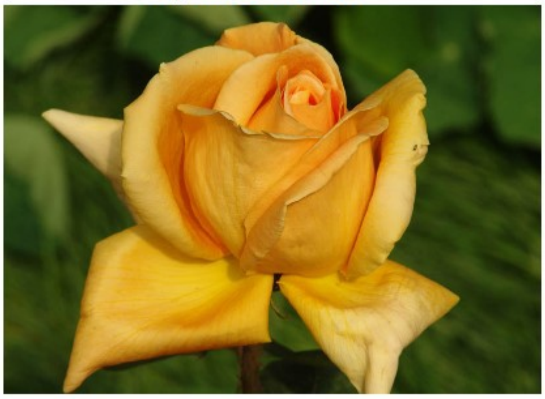
"Ahimsa" / "Orient Gold"
(Viru)



"Apricot Nectar"



"Nefertiti"
(Viru)



"Vienna Charm"

Yellow/golden roses

The range of colours in golden roses is equally large. We have roses in pale yellow, dark yellow verging on gold, greenish yellow, apricot yellow, golden apricot, as well as the red and yellow bicolours - the range is endless. This spectacular array of golden colours is almost entirely due to the breakthrough achieved by the great French hybridiser, Pernet Ducher, who, after years of effort, succeeded in crossing the golden rose of Persia, *R. foetida persiana* with modern roses to produce the first real yellow rose, ‘Soleil d’Or’, owing its colour to carotenoid pigment, as I already mentioned. Along with the earlier range of yellow colours *R. foetida*, in its bicolour form, led to the dazzling bicolour Hybrid Teas in red reverse yellow and thereafter to many other combinations of the two colours.

Independence, Super Star, Summer Holiday

The next major breakthrough in colours of roses came with the introduction of the variety ‘Independence’ (1951) where, for the first time the orange pigment, pelargonidin, an anthocyanin, manifested itself through the agency of the floribunda rose ‘Baby Chateaux’. The brightest colours of all modern roses is the result of pelargonidin being present simultaneously with the carotenoid yellows. While on the subject of bright colours it is not only the admixture of anthocyanin and carotenoid pigments that creates these exciting colours but the admixture in such a proportion that the light comes through the petals - if there is too high a proportion of carotenoid, which is opaque to light, we get somewhat flat colours lacking in brightness for the reason that the carotenoid in such concentration prevents the transmission of light through the petals. It is my pleasure to acknowledge that this brilliant resulted from the work of Dr. David Leach, the great authority on rhododendrons. It is due to this synthesis of ideas from different plant groups that novelty is further enhanced.

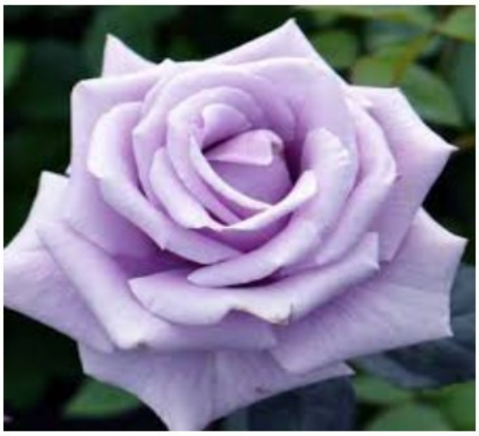
“Independence”

“Super Star”

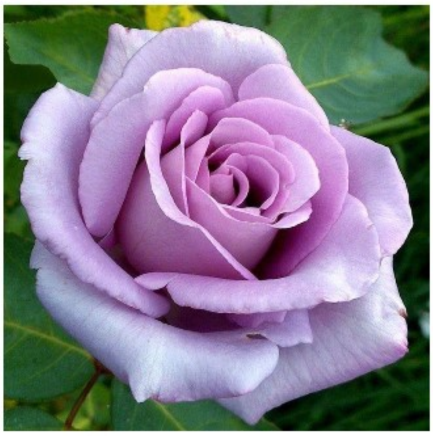
“Summer Holiday”

Unusual colors

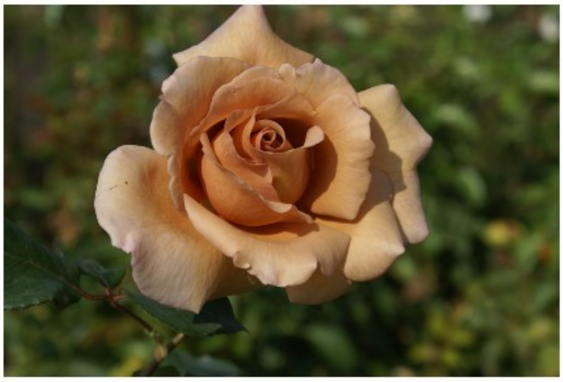
We come finally to roses in unusual colours -- lilac, purple and brown shades. As the famous English hybridiser Le Grice observed, these colours arose from a complete admixture of the rose pigments. The first notable success was Sterling Silver, but there are many others currently available. But as you would have noticed the range of colours available earlier did not include a true blue, because the pigment for blue colours, delphinidum, is not available in the rose family. But we do not have long to wait as the work initiated in Australia and now being carried forward by your country has led to the introduction of the blue pigment into roses. But further efforts are required as the pH of the petals of the rose is not what it should be if the delphinidum is to express itself at full strength.



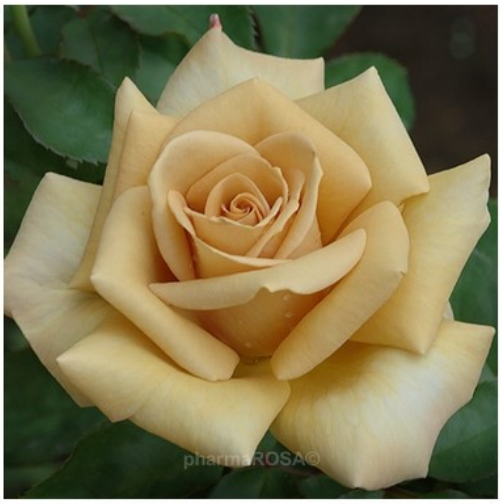
“Sterling Silver”



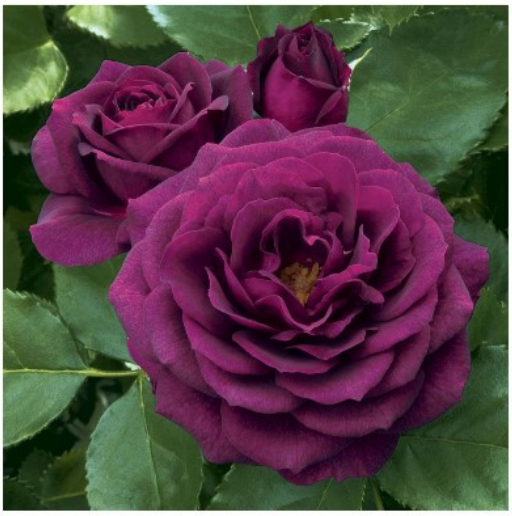
“Blue Moon”



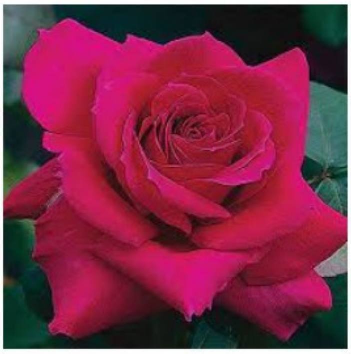
“Julia’s Rose”



“Honey Dijon”



“Ebb Tide”



“Big Purple”

Fragrance

Rosa damascena Bifera

Rosa moschata nastarana

"Papa Meilland"

"Sutter's Gold"

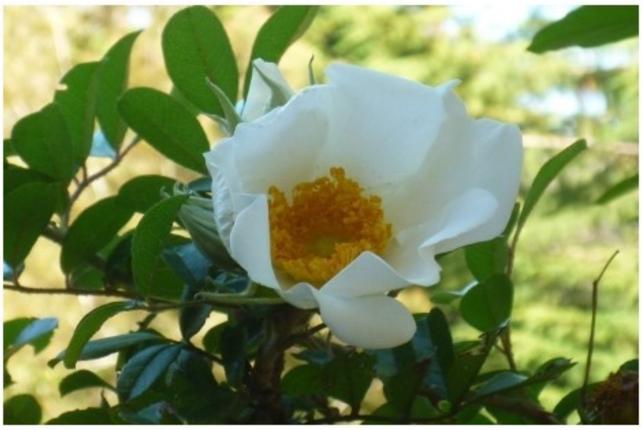
The other aspect of the rose which enthrals gardeners is fragrance. Here again we have so many types – the damask fragrance, mainly of the red roses, the fruity fragrance of roses in which the damask fragrance is in combination with other genes for fragrance, as also the citrus fragrance. In a different category is the fragrance of the musk rose – *R. moschata*, which carries in the air so that you get the fragrance from quite far away. Intriguingly, some of my new range of roses based on *R. clinophylla* have a lovely different fragrance, which wafts in the air.

Thus far I have dealt with the myriad features of the rose which adds so much to the charm of the rose family.

I now turn to our efforts to start fresh lines of breeding for India and the other warmer parts of the world in the background of the ideas outlined above.

My choice fell on two Indian wild roses:

Rosa clinophylla and *Rosa gigantea*

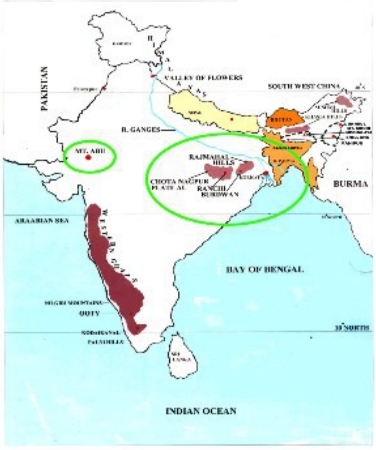


Rosa clinophylla

Clinophylla - flower, jheels

Rosa clinophylla

Rosa clinophylla is a very unique rose species indeed. It is perhaps the only truly tropical species among the 150 + wild roses of the world. Its habitat is also most unusual. Typically the islands of the River Ganges and the edges of lakes, called ‘jheels’. Both these locations get submerged in wate, as does the rose too, in the rainy season called monsoon. An unusual feature of this species is its fragrance – that of acetone, nail polish remover!!



R.clinophylla- sometimes called *R.lyelli*

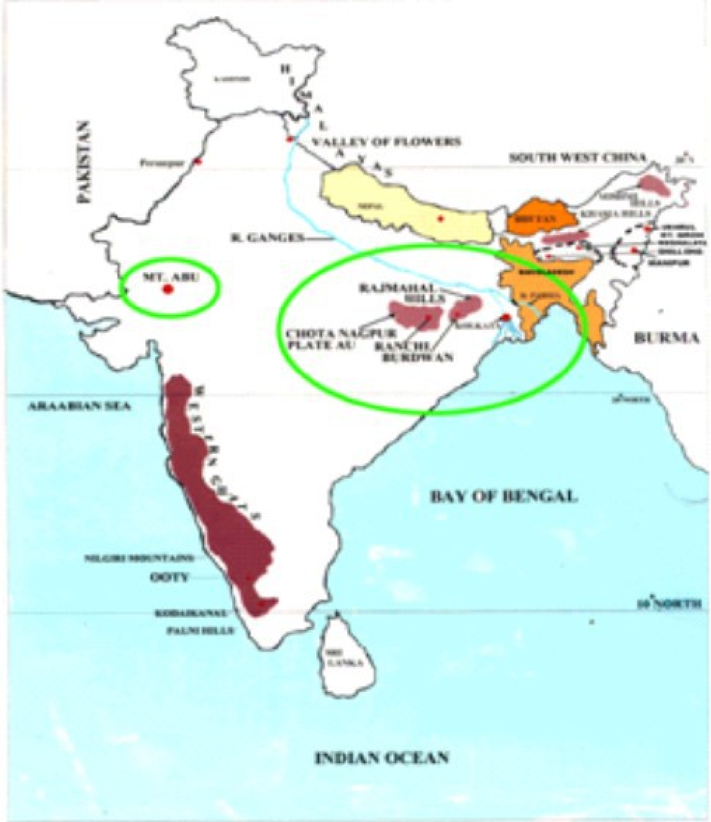
R. clinophylla **sub tropical form at Mt Abu**

Mount Abu Rajasthan

ount-Abu lake margin where we found the species

Bush of R. Clinophylla, Mount Abu form, growing on field boundary, Oriya Village, Mt.Abu. Note the size of the plant.

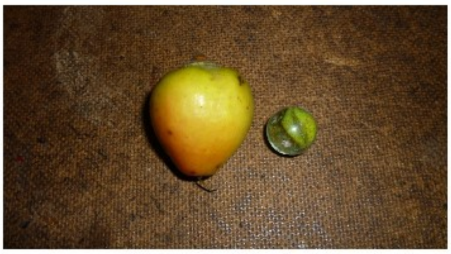
R.clinophylla Chota Nagpur form-habitat: warm dry climate



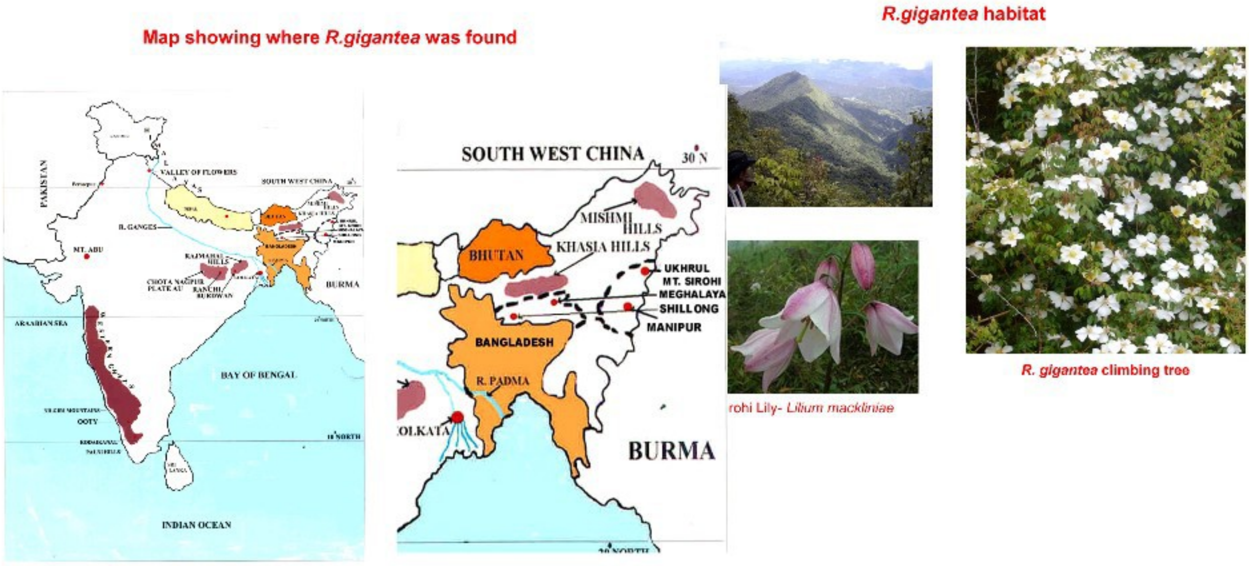
Narender Singh of Ranchi would have found this form of clinophylla here

Rosa gigantea

Rosa gigantea



Rosa gigantea Hip



Map showing *Rosa gigantea* and habitat

Rosa gigantea on the other hand is the great rose of the subtropics and warm temperate zones. Its habitat is the mountains of North east India at moderate altitudes, around 1500 metres. It has the distinction of being the world's largest growing rose, clambering to heights of more than 50 metres on the forest trees of the habitat, bearing very large single flowers almost 15 cms across. Even the hips are very large, the largest among rose species, like small apples.

Rosa clinophylla

Taking up the work of *R. clinophylla* first, I would like to tell you how we got our first plant of this species. Our friend Mr. Narender Sigh was on a hunting trip, sometime in the 1980's and had camped on the edge of a forest stream in the Chota Nagpur Plateau, not too far from where the River Ganges flows, and one morning, as the sun was rising, he saw, to his surprise a rose with white single flowers on the water's edge. Recalling our description of the habitat of this species, and our search for it, he shrewdly guessed this was perhaps the species, so he collected plant material and posted it to us. We were able to root the cuttings, and it was indeed *Rosa clinophylla*.

The way in which this species was originally discovered is equally fascinating. A Superintendent of Post Offices, during British times in India, appropriately named Mr. Rose, was, in the year 1820, travelling by boat, since it was the rainy season, on his usual inspection of post offices in the Bengal region of eastern India. To his surprise he found a rose coming out of the water of the jheel (I showed you pictures of jheels earlier). He collected plant material and rose hips and sent them to the taxonomists in Europe, including the famous Monsieur Crépin of Belgium, who identified it as a new type of rose species, giving it the name *Rosa involucrata*, which later was changed to *Rosa clinophylla*.

As you can see such a rose is perfectly adapted to life in swampy conditions, and that area of Bengal is very tropical indeed. At the time that I was searching for this species in the 1980's, there was only one cultivated plant in existence in entire India – a species which was found abundantly in the past.

Apart from the tropical forms of *R. clinophylla* there is a subtropical form referred to as *Rosa lyellii.* This is typically found at low altitudes on the Himalayan mountains and astonishingly, on a solitary peak, Mt. Abu, rising out of the Thar Desert in Rajasthan State in the extreme west of India. Specimens of this form were collected personally by us after extensive search in Mt Abu. This kind, unlike *R. clinophylla* produces flowers in corymbs.

As you can understand, *Rosa clinophylla* with its unique habitat, is very far removed genetically from the modern rose. Working with this wild rose was very difficult, but ultimately, out of nearly 200 crosses made with the well known Tea rose 'Mrs B.R. Cant', a few seeds were secured, out of which only two germinated. One seedling promptly died, but the other, though weak, survived, to produce small single pink flowers. Back-crossing it with 'Mrs B.R. Cant' produced a more robust plant, which I gave the study name 'Pink Pink', and this plant became the starting point of my new *clinophylla* line of hybrids.

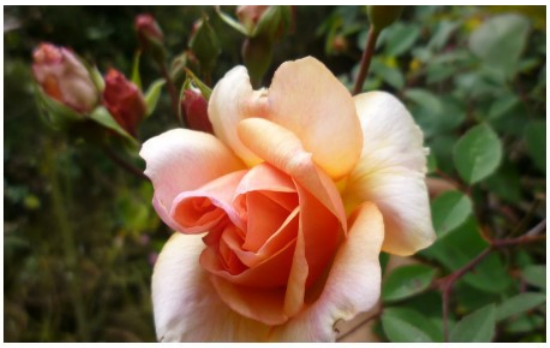
“Pink Pink”

Rosa clinophylla X Rosa bracteata

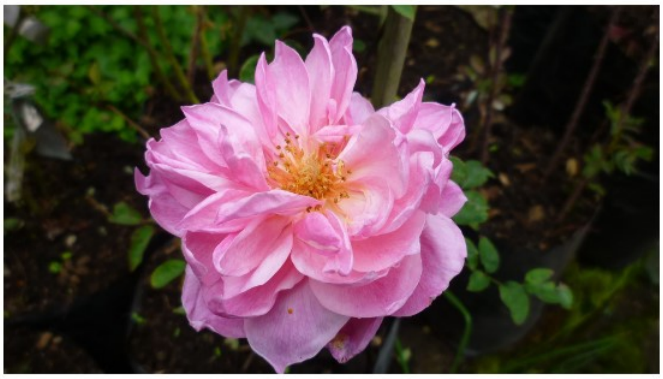
Meanwhile I had noticed that *R.clinophylla* had a close relative, *Rosa bracteata*, which was much better adapted to dry climates. The two species were inter-crossed to get hybrids better adapted to normal garden conditions and these were used to start a new breeding line, by crossing with the floribunda rose ‘Little Darling’, which as the great miniature rose breeder, Ralph Moore, has demonstrated, is good rose parent. My cross produced a repeat flowering small growing plant in salmon pink and this hybrid was used for further work.

Going back to Pink Pink, a series of crosses were made with the Noisette ‘Rêve d’Or’, which does well in warm climates, as seed parent, and surprise, the cross produced a range of compact growing repeat flowering roses, from which I started another line of hybrids

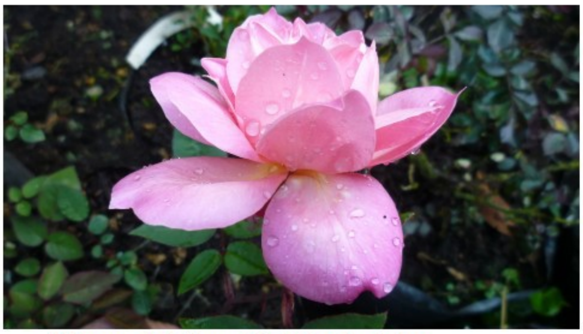
Further work with these resulted in a number of *clinophylla* Teas:



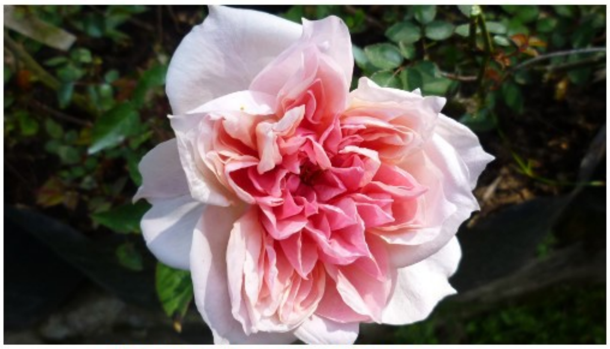
Apricot Patio Tea



Lilac Pink Patio Tea

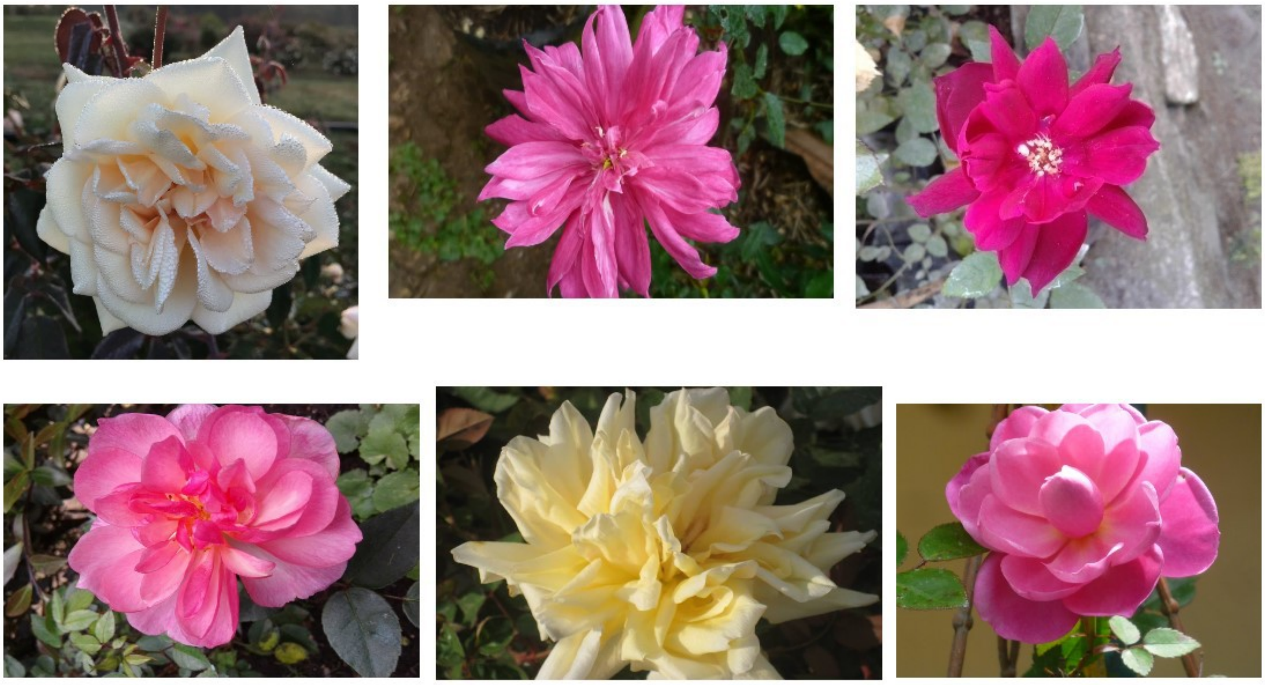


Water Melon Pink Patio Tea



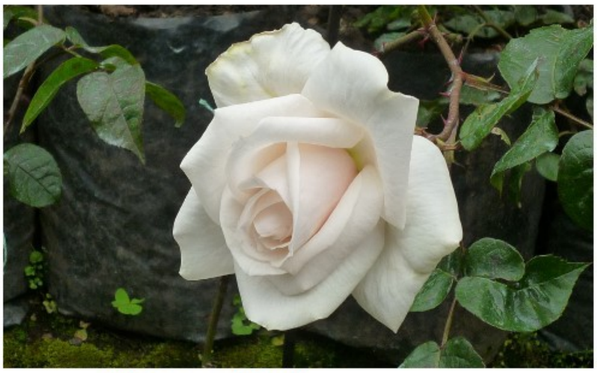
Old Rose Form Patio Tea

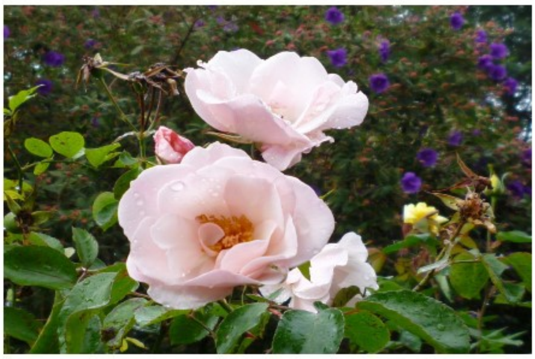
Dwarf cluster flowered roses – Patio Teas - Burugul apricot, old rose form watermelon pink

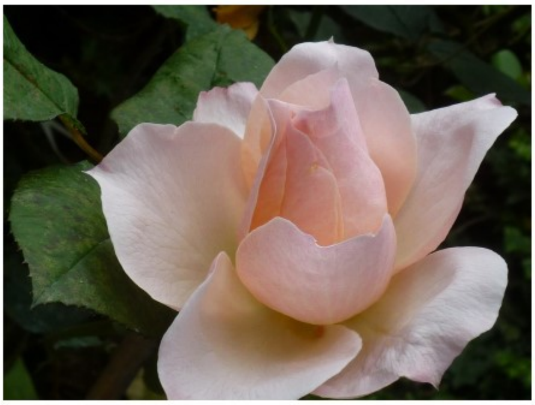


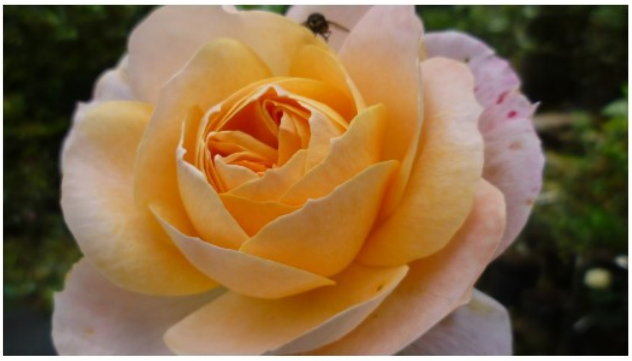
Some Patio Tea seedlings

Some released Clinophylla-Hybrids


"Ganges Mist"


"Silver Dawn"


"Narender " / "Pat Henry"


"E.K.Janaki Ammal "

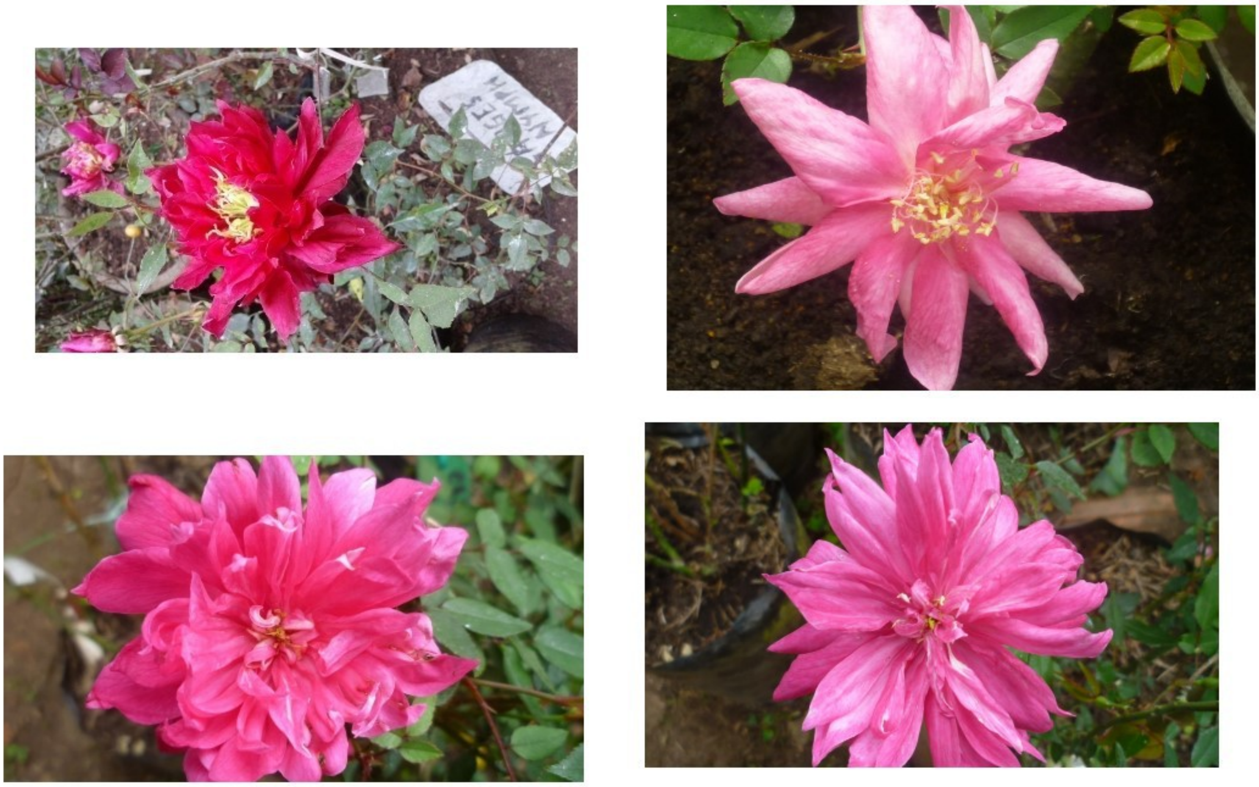
In some ways it was easier to progress with the line starting from 'Little Darling' into *clinophylla/bracteata* hybrids, since I suspected that they were probably triploid (with 3 sets of chromosomes) and therefore easier to hybridise with modern roses which are tetraploid (4 sets of chromosomes). So the choice of other parents was wider. I had many introducible roses

There are many more in the pipeline, including the brilliant coloured 'VirPillar'

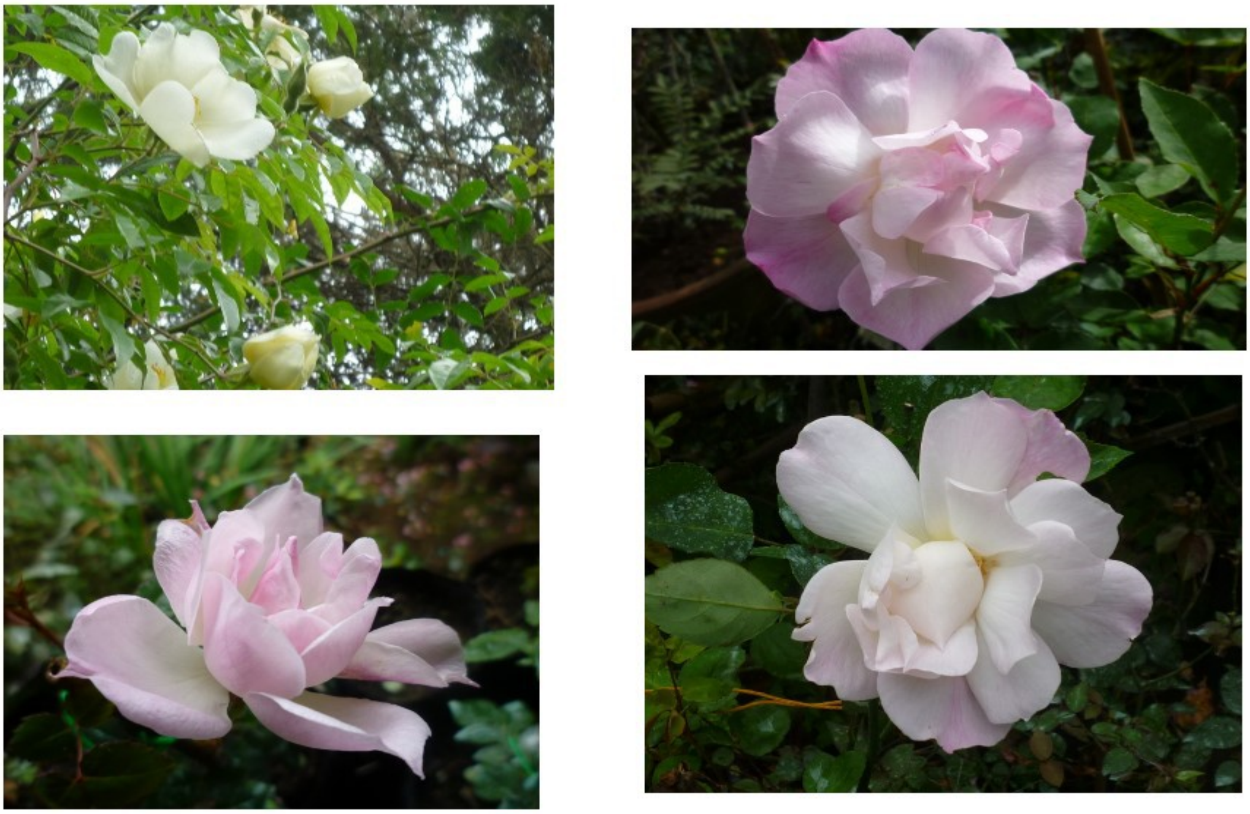
As many experts have predicted the introduction of a new species can lead to roses with different fragrance and an outstanding example is 'Pat Henry' which is so strongly perfumed that the fragrance floats in the air in the manner of the musk rose

VirPillar – The future

Rosa clinophylla also led to the creation of new flower forms:

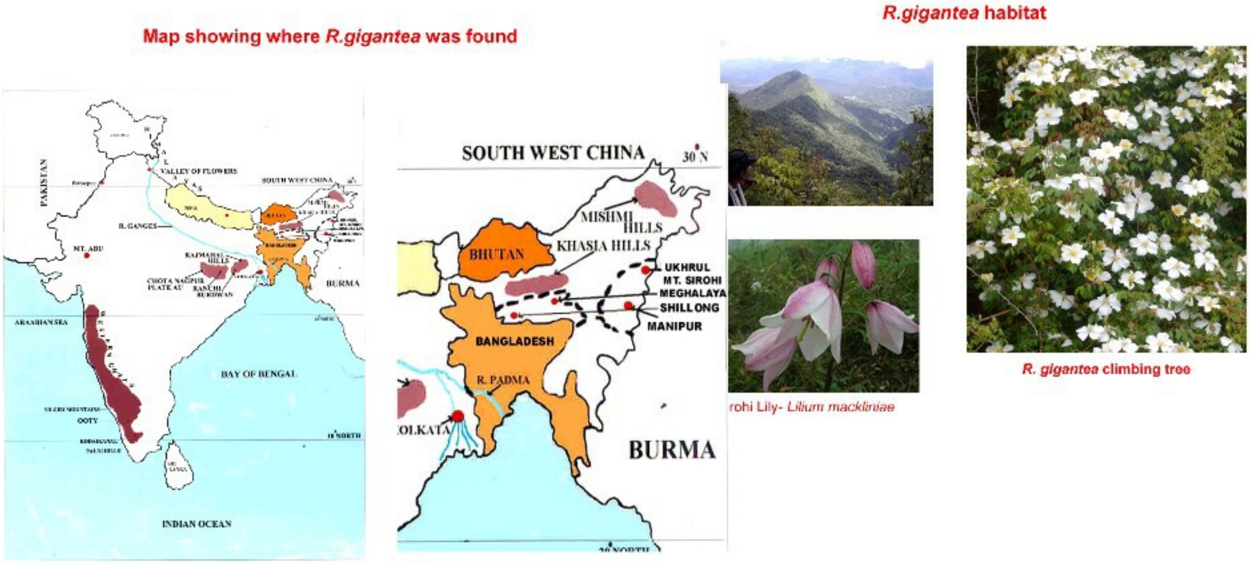


'Ganges Nymph' and Look-alikes



Rosa clinophylla x *Rosa gigantea* and seedlings

One other approach of using *R. clinophylla* was provided by my inter-species hybrid (*R. clinophylla* x *R. gigantea*), which was in many ways a composite of the two species, with foliage much more like *R. clinophylla* and with creamy yellow flowers like *R. gigantea*. From this hybrid a series of new roses has been initiated and I show a few.



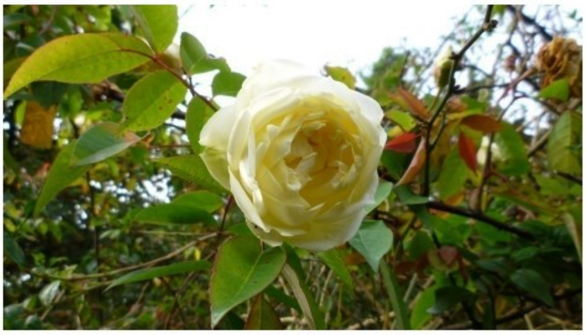
Rosa gigantea Habitat

Rosa gigantea

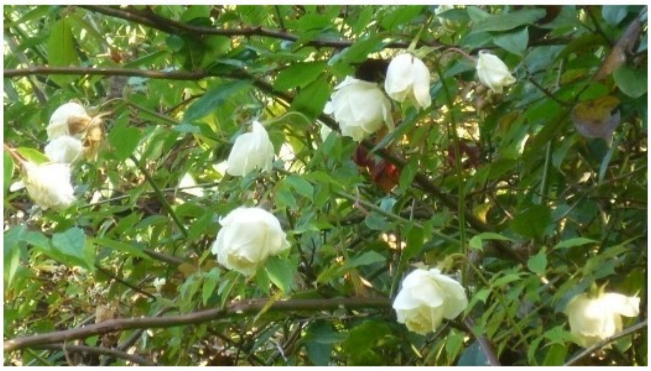
Coming now to work on *R. gigantea* a few words on how we discovered the species, in 1990, on Mt. Sirohi in Manipur State of North east India, quite near the border with Myanmar (Burma). Sir George Watt, who originally discovered the species in 1882 has given some interesting details of how and where he found this rose, which has been quoted in Ellen Willmot's famous treatise, 'The Genus Rosa'. The well known plant explorer Frank Kingdon Ward rediscovered it in the 1930s. We also managed to get confirmation from a botanist who had, in the 1980s, located it in the same area.

Mt. Sirohi rises to a height of around 5000 metres. There is fortunately a jeepable road for few kilometres from the mountain base, but thereafter one has to trek. It however proved easy to find the rose as many specimens could be seen clambering the forest trees, some reaching well over 15 metres and supported by the tree trunks. It was peak winter and though it was the middle of the day the frost still lay on the ground. To our surprise there were some hips on the plants so we collected a few and some cuttings. The seeds germinated quite easily in our mountain home in Kodaikanal which is at an altitude of 2200 metres, in south India – the climate not very different from the lower slopes of Mt. Sirohi. The seedlings grew very fast and first flowers appeared in 1994.

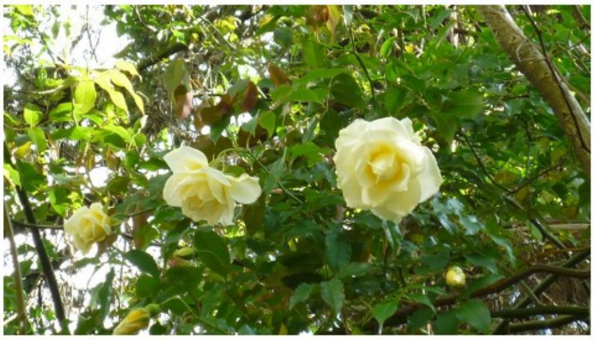
Gigantea Climbers



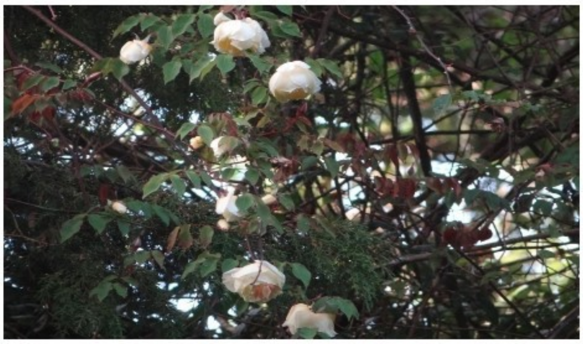
"Manipur Magic"



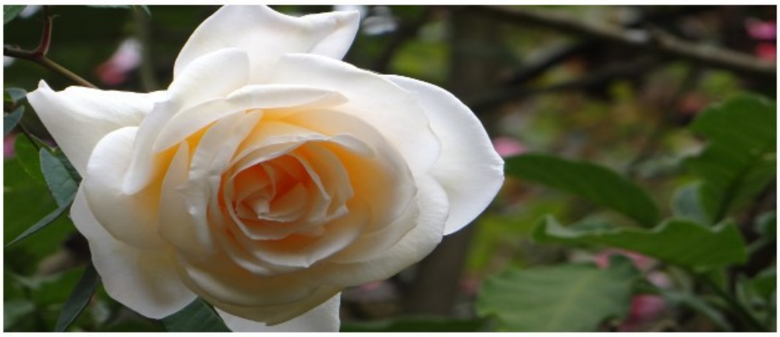
"Tangkhul Treasure"



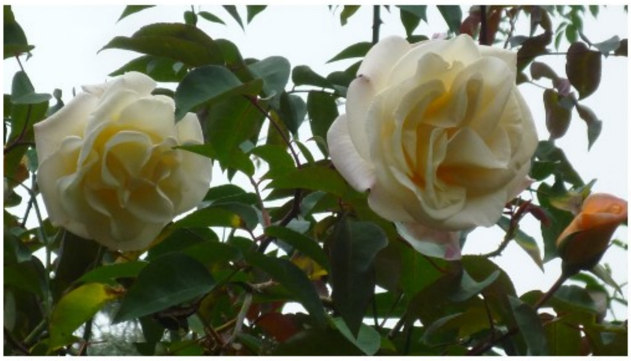
"Sir George Watt"



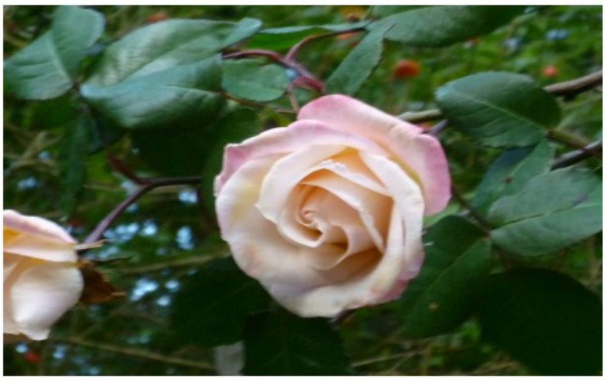
"Sir Henry Collett"



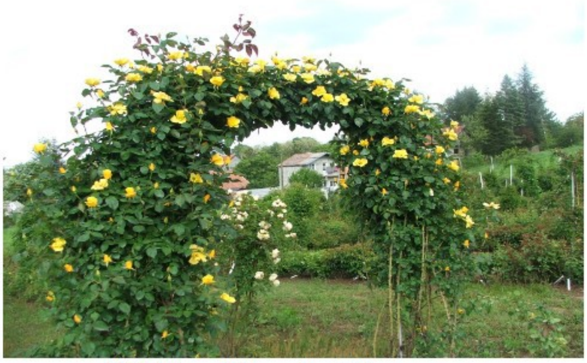
"Maebara's Dream"

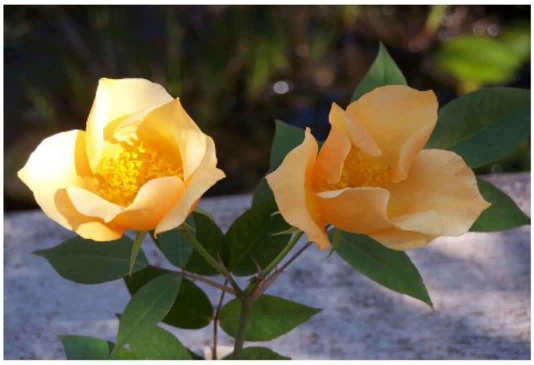


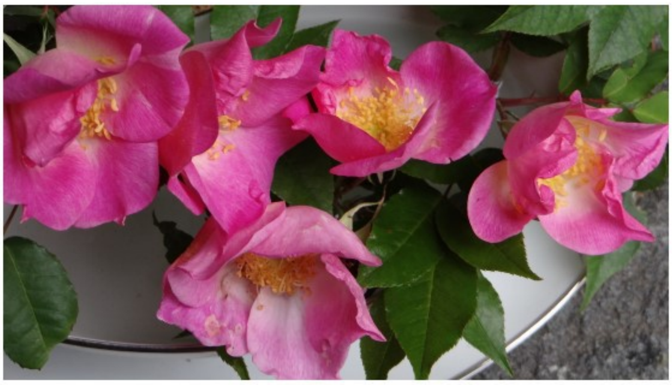
"Evergreen Gene"

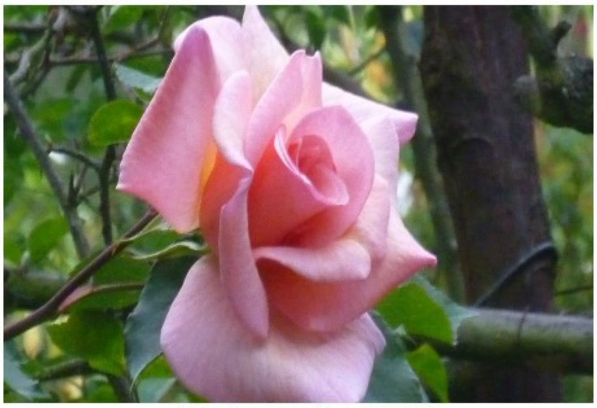


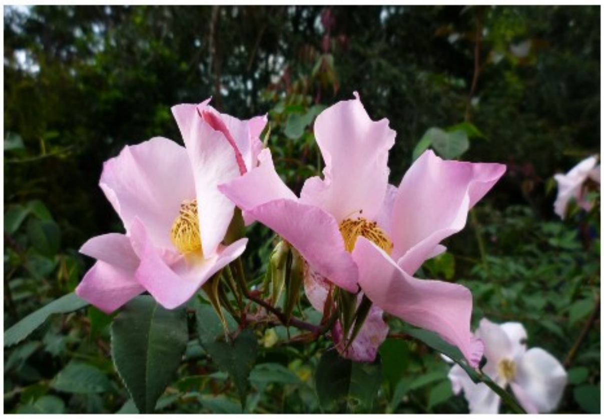
"Frank Kingdon Ward"

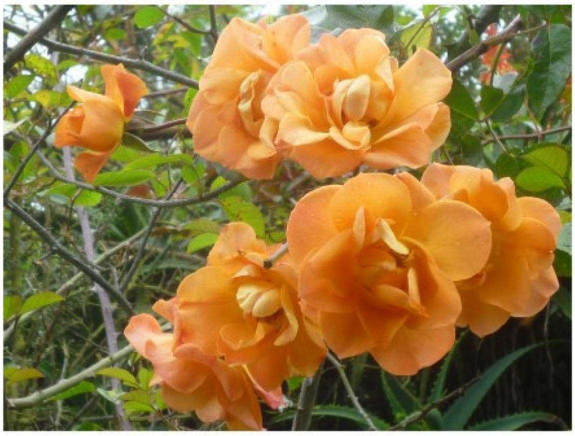

"Golden Threshold"


"Amber Cloud"


"Mia Grondahl"


"Sakura Sunset"


"Rebecca's Choice"

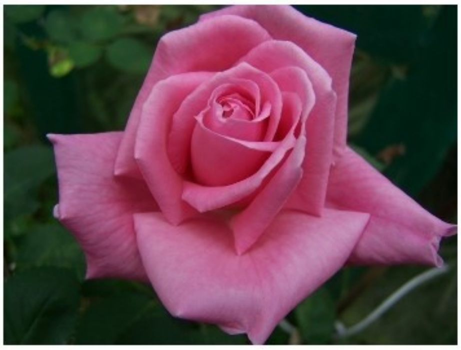

"Karrie's Rose"

Repeat flowering gigantea-shrubs

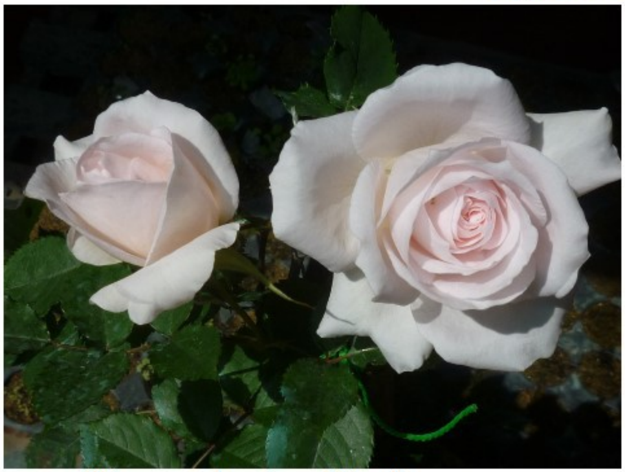
As some of you know, *R. gigantea* is one of the ancestor species of the modern rose. So work with this was somewhat easier than with *R. clinophylla*. Two kinds of crosses were made, using it as pollen parent. The first series was with the Noisette climber ‘Rêve d’Or’, which I have mentioned earlier as being well adapted to warm climates.

Another approach was a leap in the dark. We had noticed that the French H.T., ‘Carmosine’, which bears large broad-petalled flowers in shades of pink and orange red, was well adapted to our climate, so crosses were made, in spite of the fact that ‘Carmosine’ is likely a tetraploid (4 sets of chromosomes) and *R. gigantea*, a diploid (2 sets). Surprisingly, we got a few seedlings - this was a great step forward.

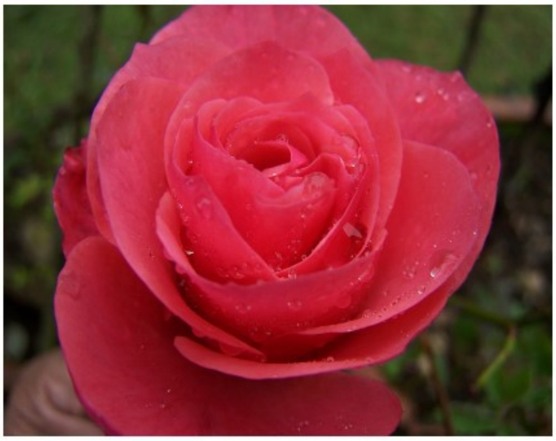
To better elucidate what has been discussed about I will show you some photographs displaying the steps in evolving the new hybrid line with *R gigantea* as well as some photographs of various new varieties which have been created for being grown in our gardens.



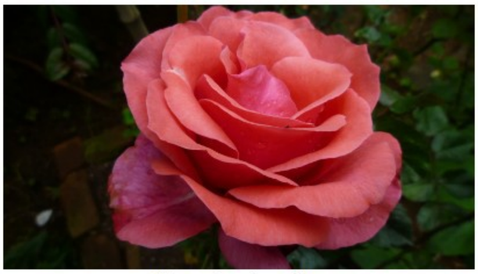
“Naga Belle”



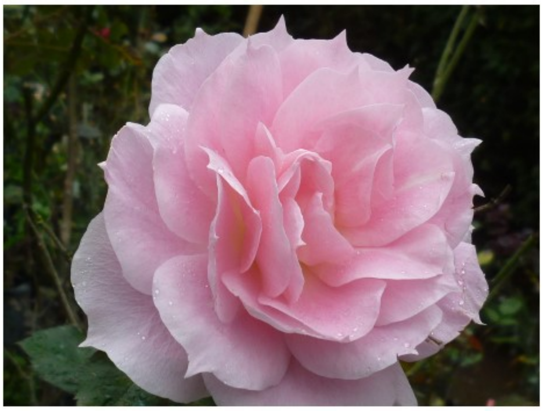
“Remembering Nico”



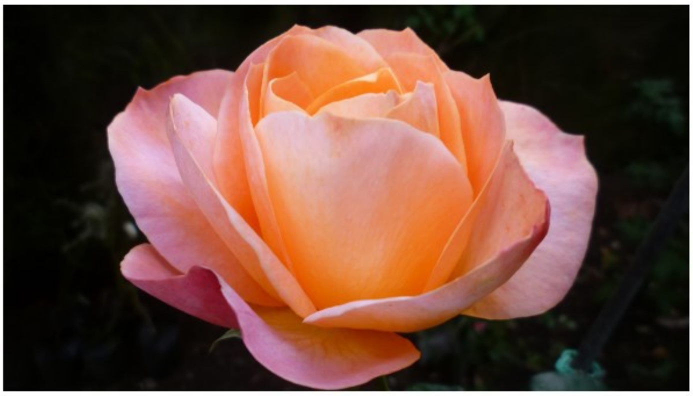
“Sirohi Sunrise”



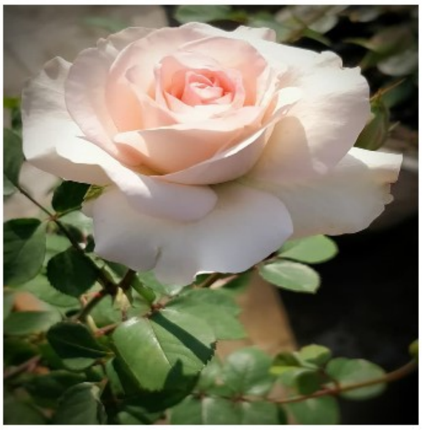
"Agnimitra"



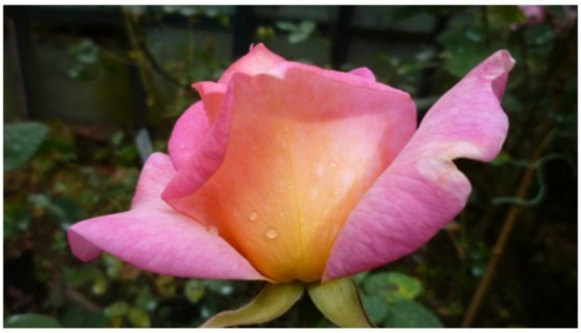
"Allegory of Spring"



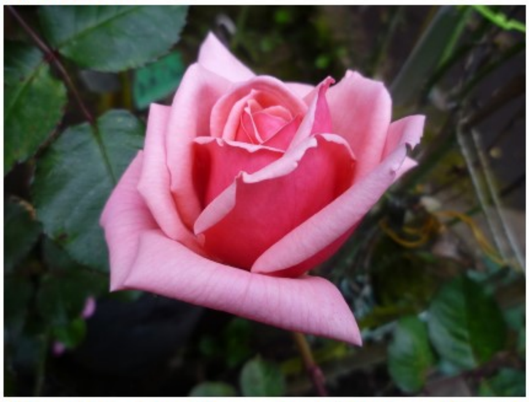
"Helga's Quest" / "Vishnupriya"



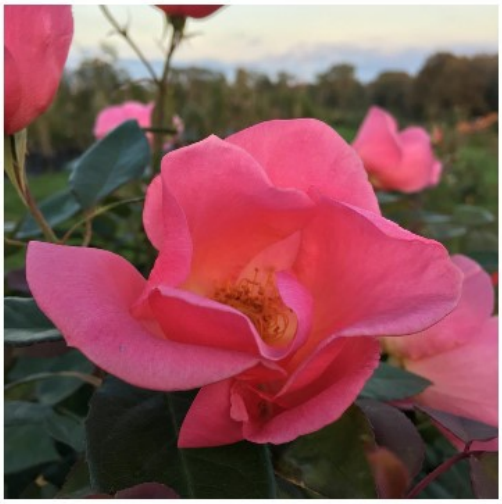
"Kindly Light"/ "Swami Vinayananda"



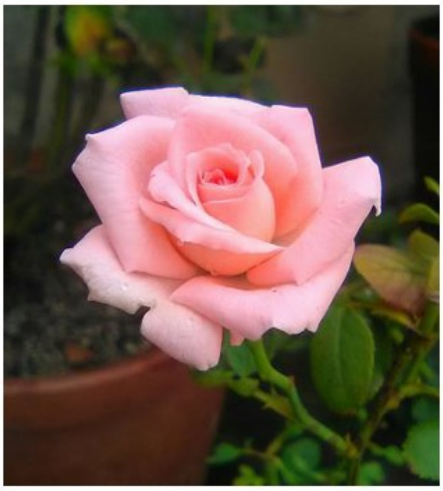
"Maria Cecilia Freeman"/ "Dr. N.C.Sen"



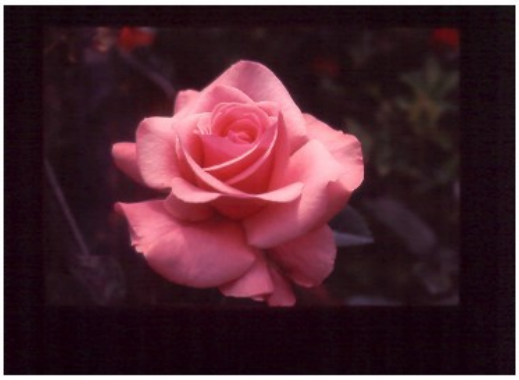
"Dr.Malcolm Manners"/ "Rose Manju"



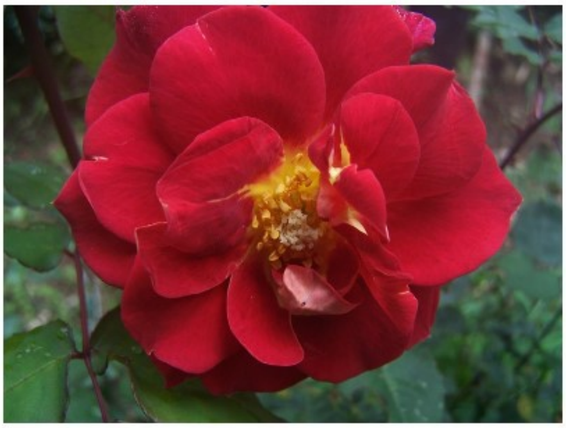
“Adrianna Zarri”



“Churachand “



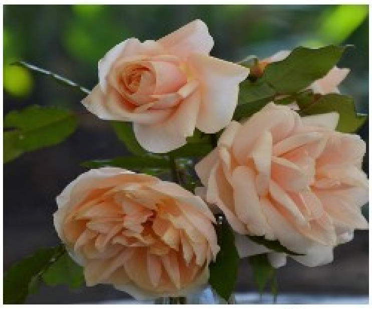
“Pink Prelude”



“Emina”

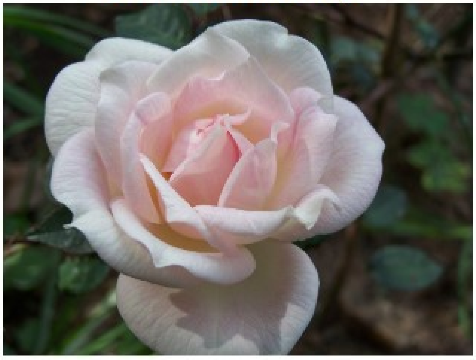
Repeat flowering gigantea-shrubs

Tea Roses

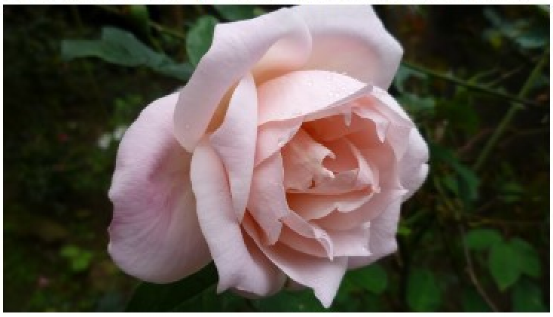


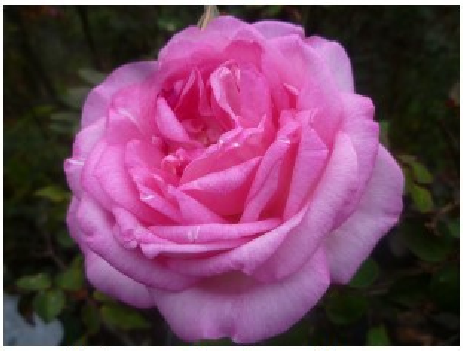
“Aussie Sixer”

“Faith Whittlesey”

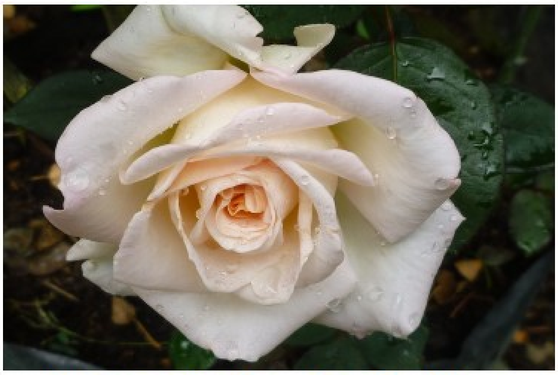


“Lotus Born”/ “Padmasambhava”





“Maura la Cava”



“Remembering Cochet”

Unusual colours

I now come to the third part of my talk, which deals with our efforts to create roses in unusual colours, especially in lilac purple and brown shades as well as the ‘hand-painted’ strain. Coming to the range of lilac purple colours the strain evolved is basically one started from the purple floribunda ‘News’ bred by Le Grice. ‘News’ carries in it the genes of the purple Gallica, ‘Tuscany Superb’ and is thus a variety of great interest to hybridisers. Apart from ’News’ one other significant step forward was the introduction into the line of that stunning rose ‘Rhapsody in Blue’ which shows shades of blue-purple rather than the more common red-purple.

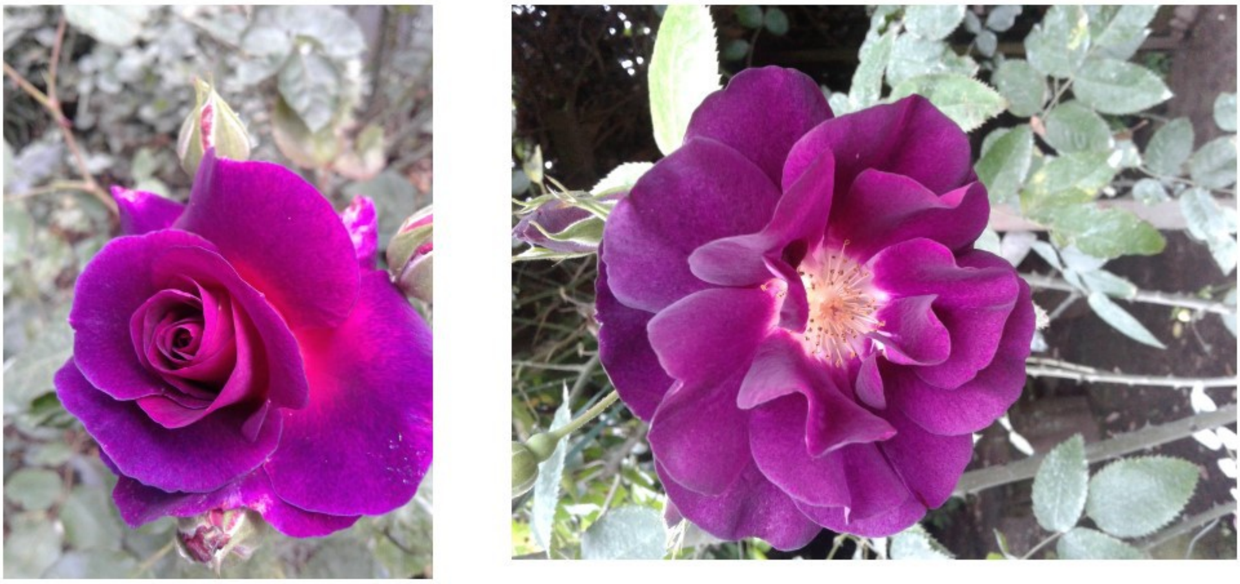
"Tuscany Superb"

"News"

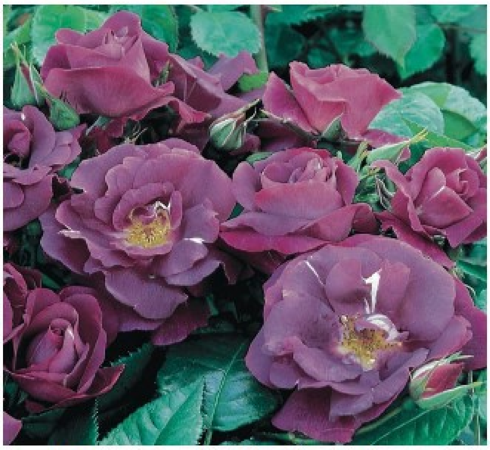
"Vanamali" (Viru)

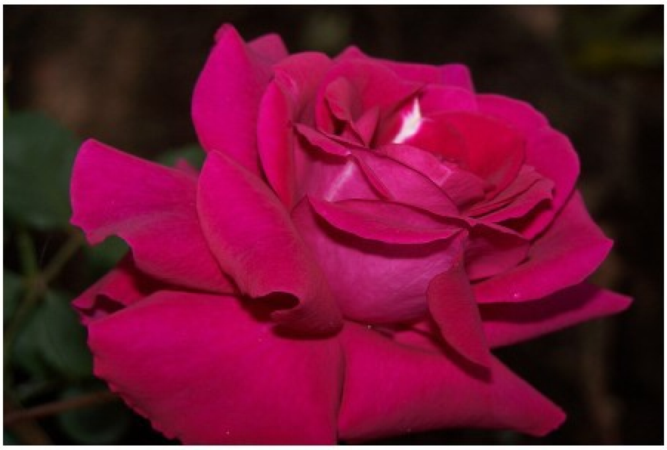
"Incense Indigo" (Viru)

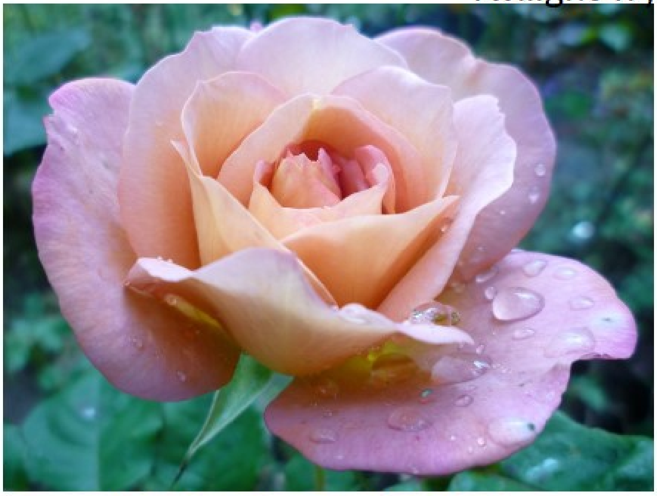
As I mentioned earlier, brown shades also arise from the same combination of genes and I will show you the results obtained till now.



New Purple Seedlings

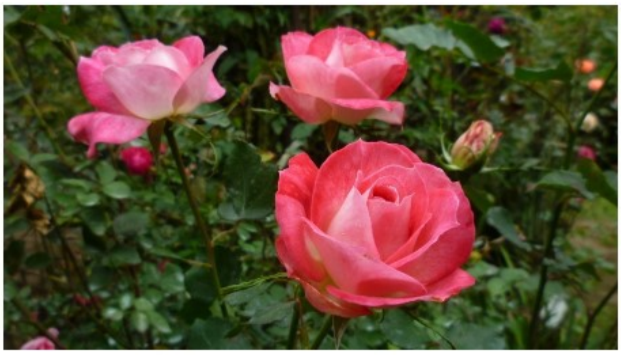

“Rhapsody in Blue”


“Twilight Tryst” (Viru)

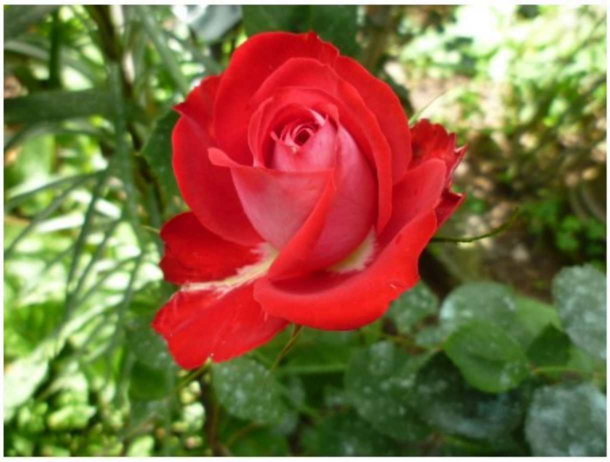

“Coffee Country” (Viru)

Hand painted roses

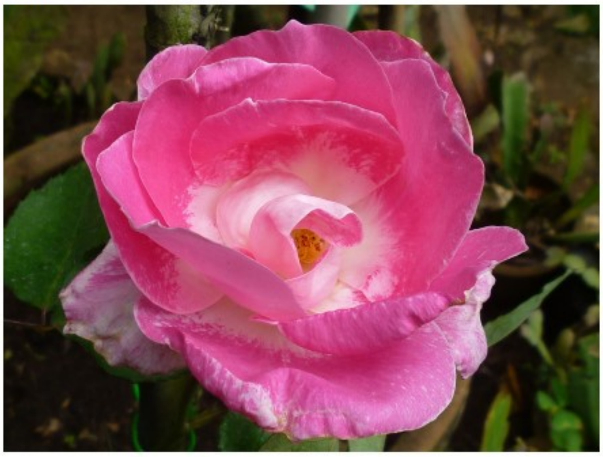
Coming to the ’hand-painted’ strain, as many of you may be aware the pioneering hybrid which lies at the origin of the strain is Sam McGredy’s ‘Picasso’, which shows pink, and white colours mixed together, each flower having a different proportion of the two colours - hence the designation ‘hand painted’. It is of great interest to note that this characteristic of varying colours is basically derived from the famous Kordes rose ’Frühlingsmorgen’ which again owes its colour to *Rosa spinossisima altaica*. In our work one other effort was to replace the pink to red and white combinations with shades of orange and white, which has also been achieved, as you can see from the photographs I show.



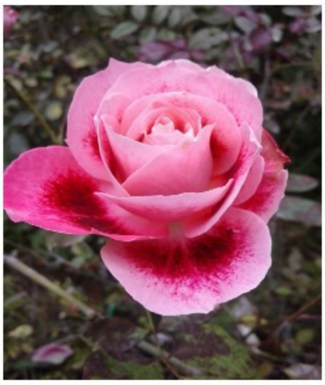
“Blushing Yuki”



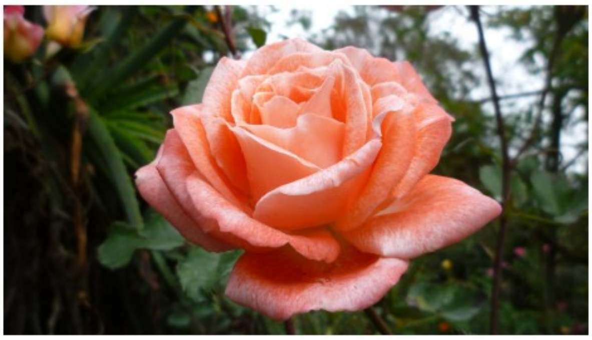
“Tipu’s Flame”



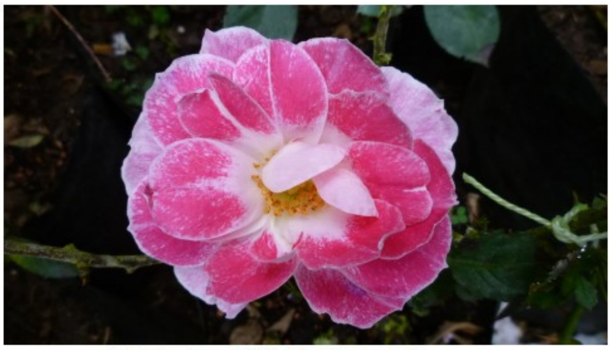
“Bodhisattwa” / “Magic East”



“Priyatama”



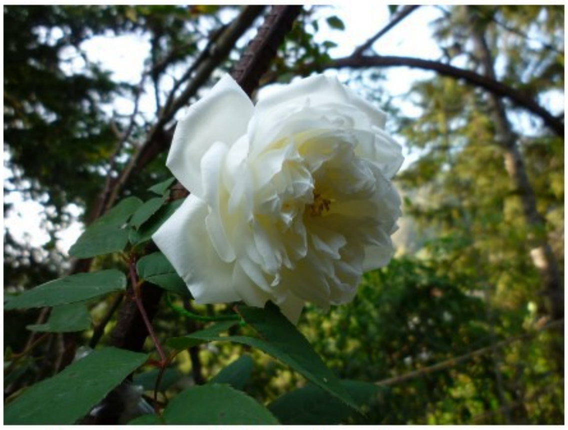
“Pat Shanley”



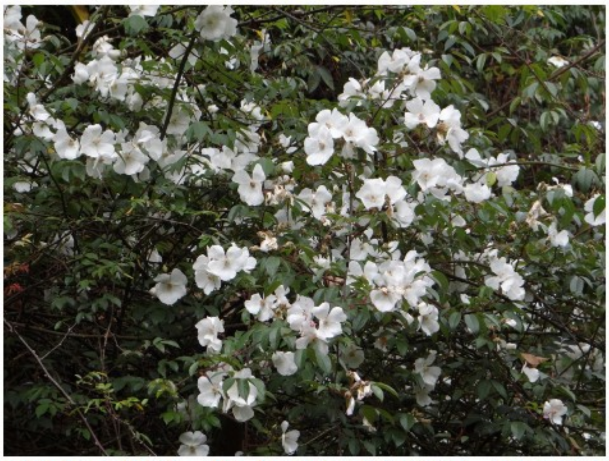
(Violaine X Priyatama)

In conclusion, may I stress again that in this effort to enrich the diversity of the rose flower, we have not only looked at the diversity in flower colour but diversity in foliage, in growth habit, in flower form,, and in fragrance. Hence the title ‘Variety is the Spice of Rose “

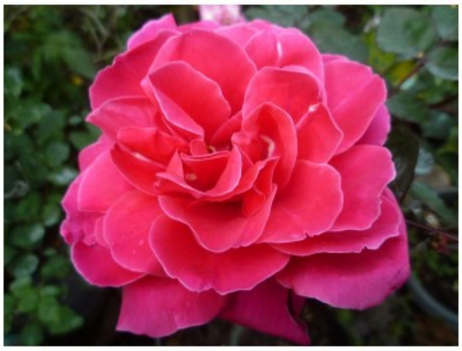
Some other Rose-Hybrids



'Leschenault de la Tour'
(R. leschenaultia hybrid)



'Lady Jane Hooker' – (R. longicuspis X R. gigantea)

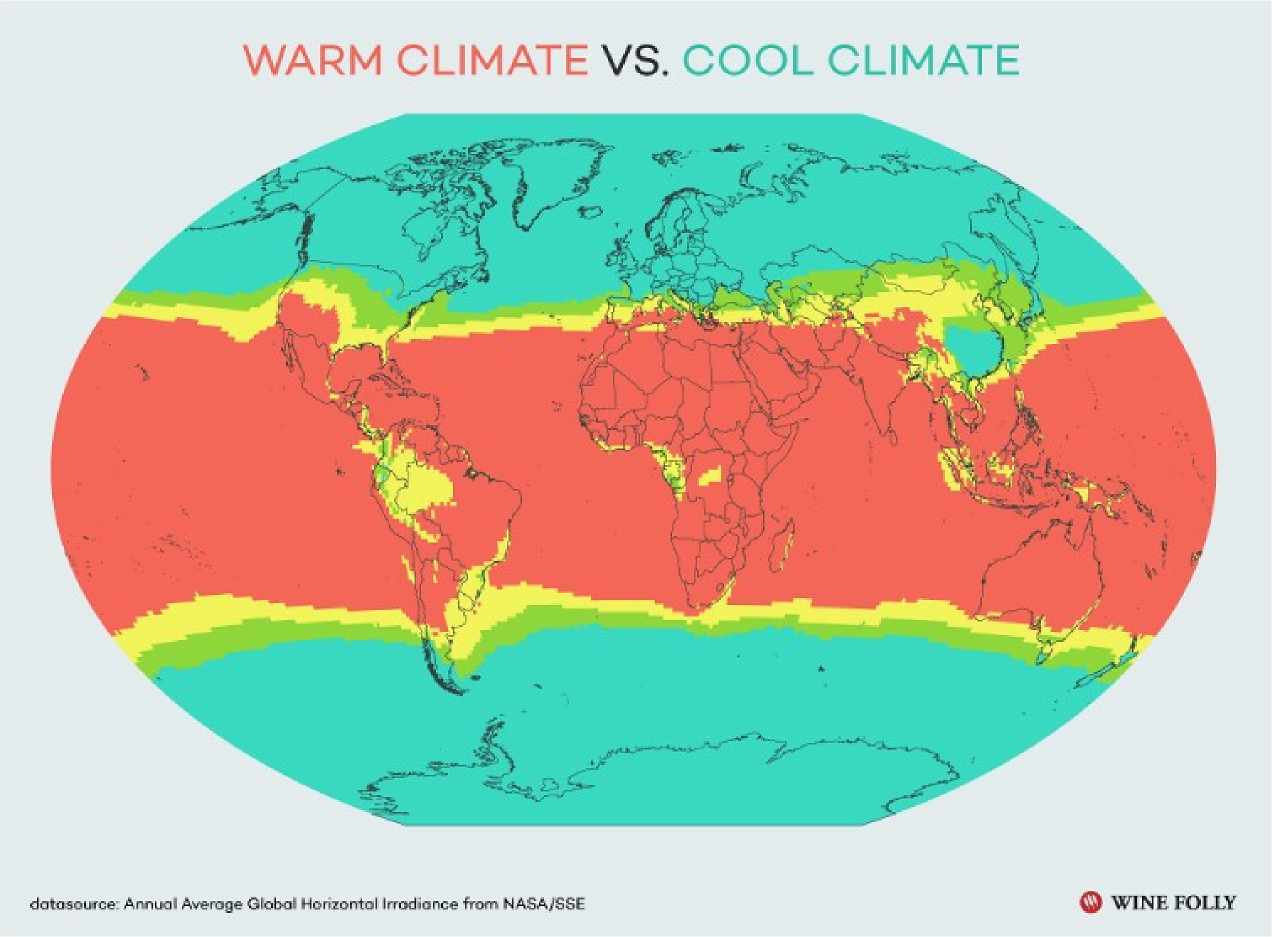


'Lyndy’s First Love' (R. Edward hybrid)

CREATING TOMORROW'S HERITAGE ROSES

Girija and M. S. Viraraghavan

A presentation held 2019 in South Africa


WARM CLIMATE VS. COOL CLIMATE
datasource: Annual Average Global Horizontal Irradiance from NASA/SSE
WINE FOLLY

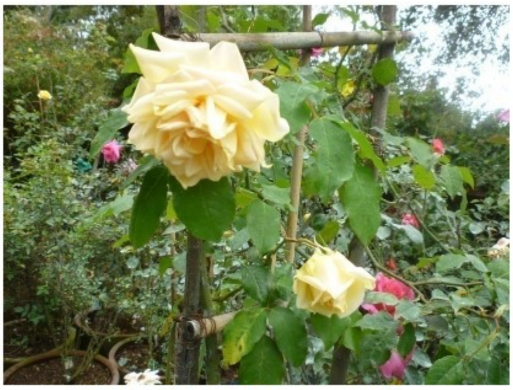
The focus of this talk is on the hybridization of new kinds of Teas, Chinas and Giganteas. These classes of roses are the typical heritage roses of the warmer parts of the world—such areas include southern USA, Southern France, Italy Spain and Portugal as well as the entire area of southern Asia, extending from south India to Thailand, Cambodia Vietnam, Malaysia, Indonesia, Singapore, —we may add that this is the region which is going to be the economic powerhouse of the future, but sadly lacking in roses suitable for their warm climates. Apart from these parts of the Old World, countries like Australia and New Zealand are eminently suited for growing the Tea rose group. In that fascinating book Roses at the Cape of Good Hope, written by your great rosarian Gwen Fagan,there are vivid descriptions of the same kinds of heritage roses which are still prized in many areas of your own country.

You may well ask, what is the need to create new Teas, Chinas and Giganteas? Do we not have enough roses of these classes which we have inherited from the golden era of such rose breeding – the end of the 19th century and the early parts of the 20th century? To this the simple answer is that breeding of such roses is very much an unfinished task. We may add, somewhat provocatively, that, unlike the modern Hybrid Teas where the genetic potential for further improvement is nearly exhausted, there is great scope to continue breeding of these older classes of roses which, to reiterate, was work suddenly stopped midway.

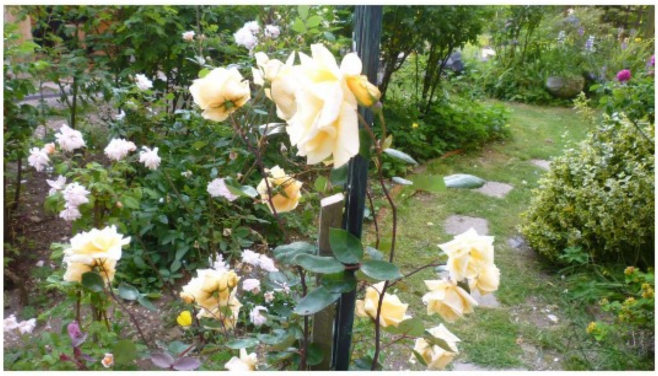
Why did the breeding of Teas, Chinas and Giganteas (we shall refer to them all as ' the Tea rose group') suddenly cease in the early part of the 20th century? This happened because the breeding of the Tea rose group was directly linked with the lifestyle of the very wealthy in Northern Europe and Great Britain. In order to escape the rigours of the northern cold, the well to do had adopted a lifestyle wherein they moved during winter and early Spring to warmer climes, for e.g., the French Riviera, and parts of Italy and Spain where many of them owned properties. . Naturally these estates had to have beautiful gardens of subtropical plants including roses. And the roses which could be grown easily in these areas and which flowered early in the year were those of the Tea rose group. Eminent rosarians, like, for instance, the American, J.H.Nicolas, who continued to have strong connections with France, referred to how the landed gentry in northern France would move, from winter to early Spring, to the Riviera to their beautifully landscaped properties, full of Tea roses. Another instance is Laurence Johnstone of Hidcote Manor in England who had a property in Menton. There were many like him. Apart from the Teas, the hybrid giganteas, which naturally flowered very early in the year and which were suited for the climate of southern France provided their gardens with roses. This lifestyle led to the tremendous interest among rose breeders in creating new varieties of the Tea rose group.

Suddenly everything changed with the First World War which, as many of us would be aware, was marked by the loss of human life on a scale never seen before, and perhaps never thereafter. We can imagine the disastrous economic consequences of this War which was followed a few years later by the Great Depression of the 1930s. So, the breeding of these warm climate roses came to an abrupt halt, as the lifestyles of even the very rich altered drastically.

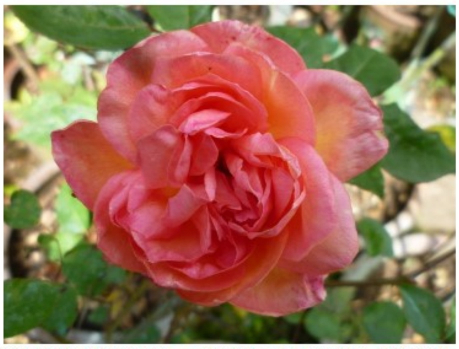
For these reasons, further breeding of warm climate roses stopped, though, by hindsight, we can understand that, from the plant breeding point of view, there was ample scope to continue work with them .In other words, the scope for creating newer varieties was there but the economic incentives to do so no longer existed. An example would be that incomparable apricot orange Tea, 'Lady Hillingdon', hybridised in 1911, just before World War 1,which remained unrivalled as the most sought after rose of that very attractive colour.



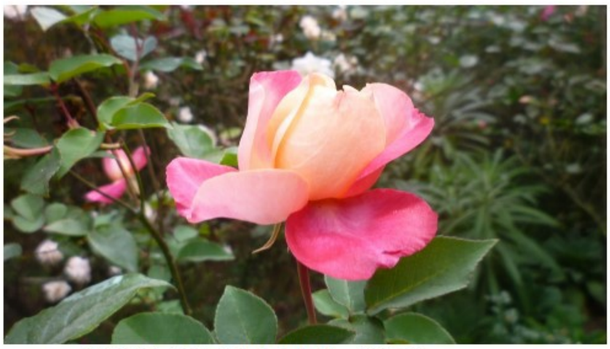
MARECHAL NIEL 1864



LADY HILLINGDON 1910



CLEMENTINA CARBONIERI 1913



ROSETTE DU LIZY 1922

Other roses of the same background which are unrivalled to this day include 'Maréchal Niel', 'Clementina Carboneri' and 'Rosette du Lizy'. If breeding of these types of roses had continued, our warm climate gardens would have been that much more attractive.

Meanwhile the Hybrid Teas arrived on the scene - they did not have the limitation of being suited only for the warm climatic areas of Europe. Again, the great rose breeders of the time were based in northern Europe like Germany, Britain and of course France. So the rose breeding fraternity changed over completely to the breeding of Hybrid Teas.

Just as the breeding of Tea roses was overwhelmed by the World War and the Depression, the breeding of Hybrid Teas is likely to face unexpected challenges in the coming years. The first is the emergence of new economies with ever increasing purchasing powers – these new economies will lie in the warmer parts of the world where the H.T.s bred for so long with cold climates in mind will not be the appropriate roses. On the other hand, the Tea rose group will be the favoured kind for these newly developing areas. This apart, we have the phenomenon of climate change with the world getting substantially warmer. This is no figment of the imagination or a phantom bogey created by mad scientists - it is very much a reality. To give a few examples. The wine grape growing areas in places as far apart as Bordeaux in France and Chile in the southern extremity of South America are already being shifted to cooler areas as the conventional locations are getting too warm for optimum yield of wine grapes. The yield of apples in the Kulu Valley located in the Western Himalayas, is coming down as sufficient chilling is not there in the winters. On our own mountain top – we live at 2200 metres altitude - plants which were earlier found only at 1500 m and below, have climbed to the top in the last decade – plants like bougainvillea, hibiscus, tecoma, forms of ipomea, to name just a few. The reality of global warming cannot be wished away. And a warmer world will certainly require more roses of our favourite classes, but not Hybrid Teas.

We come now to our own programme of creating new roses for warm climates which will, hopefully, in the fullness of time, be among the heritage roses of tomorrow!! Our programme is somewhat different from the inspiration which has led to the emergence of that glorious group of roses, with the heritage rose form and fragrance of the gallicas and damasks, but with the bonus of continuous blooming. We are referring to David Austin’s English Roses. The difference in our programme will be that we are continuing to produce Teas, Chinas and Hybrid giganteas, but particularly in the hybrid gigantea group, proceeding beyond the F1 generation where work on most of the traditional Hybrid giganteas, for e.g., 'Belle Portugaise', had stopped.

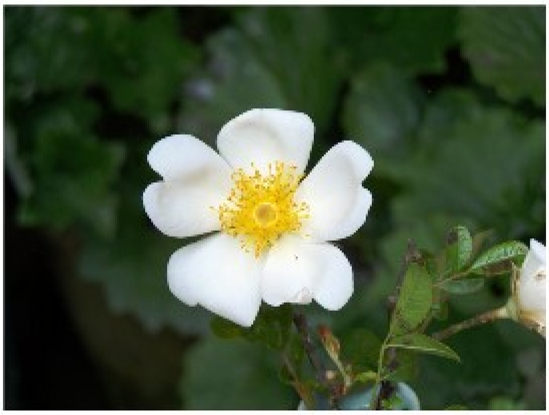
R. bracteata

R. laevigata

R. longicuspis

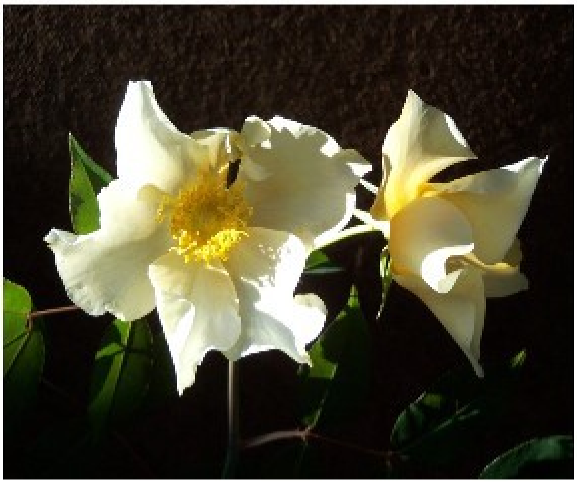
R. chinensis spontanea

Warm climate rose species



ROSA CLINOPHYLLA

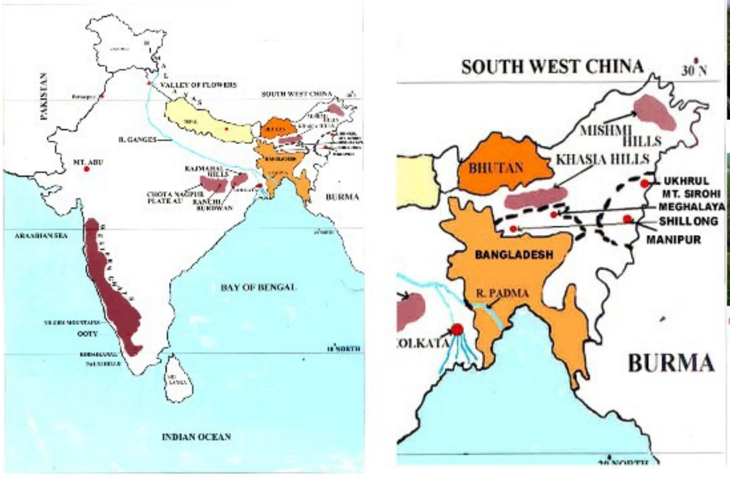
ROSA GIGANTEA



Rosa clinophylla and Rosa gigantea - Two Indian rose species

One other feature of the new programme is the enlarging of the genetic base of the warmer climate rose group by bringing in rose species specially adapted to warmth, such as *R. clinophylla, R. bracteata, R. laevigata* and several others. Even in the gigantea group the new hybrids would be the result of proceeding beyond the

Map showing where *R.gigantea* was found



***R.gigantea* habitat**

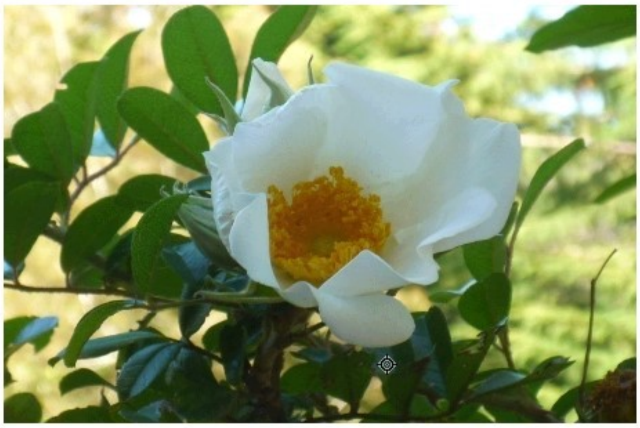
rohi Lily- *Lilium mackliniae*

R. gigantea climbing tree

first generation crosses with the objective of achieving the new combinations of genes which will lead to new colours and habits of growth.

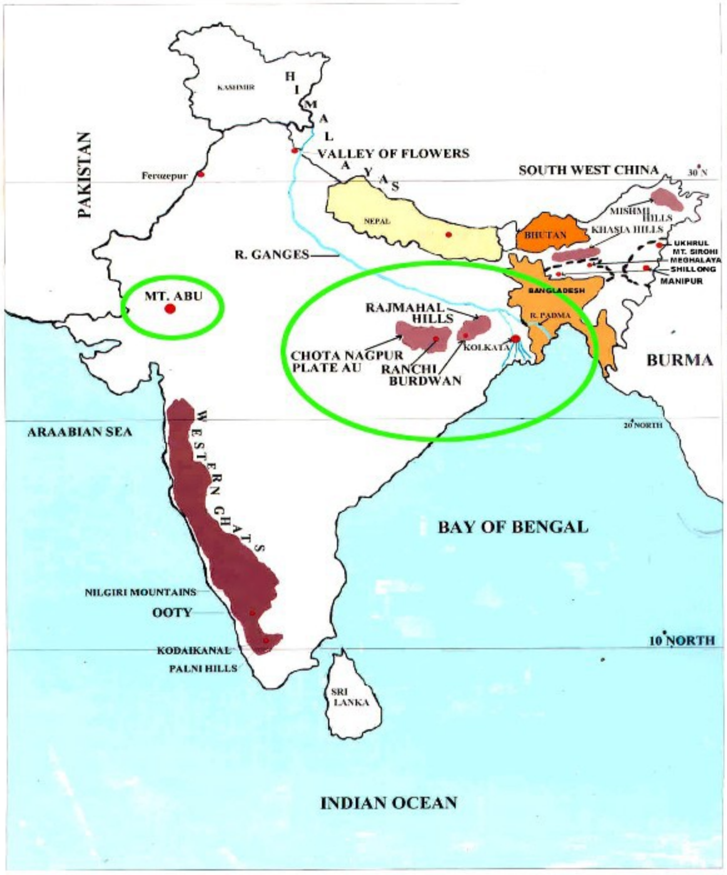
It should be noted that the *Rosa gigantea* used by us is the Manipur form collected personally from the lower slopes of Mount Sirohi beyond Ukhrul, quite near the border with Myanmar (Burma). This form of *Rosa gigantea* is probably somewhat cold hardier as the collection was made from a place 5° further north and most likely from a higher altitude than the original Burmese form collected by General Sir Henry Collett in the Shan Hills of Burma (and which was the form used in early gigantea breeding by Cayeaux and Alister Clark). Seedlings of *R. gigantea* raised from seed collected on this expedition in 1991 vary somewhat in colour from almost white to almost apricot yellow, at the bud stage - a feature also referred to by Peter Knox Shaw in his article in your recent heritage Rose Annual.

Some more detail on *Rosa clinophylla*, which is perhaps the world's only tropical rose species is warranted.

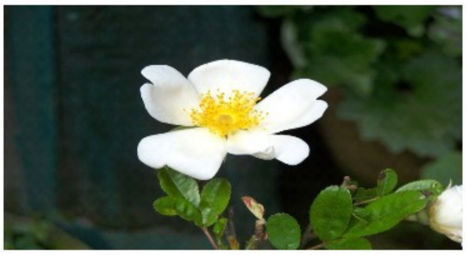


Rosa clinophylla

***R.clinophylla*, Bengal form---- habitat: warm moist climate**



***R.clinophylla* habitat; typical landscape of the interface of the Himalayas and Bengal plains**



Three forms exist, adapted to warm moist climate (Bengal form), warm dry climate (Chota-Nagpur form) and subtropical form.

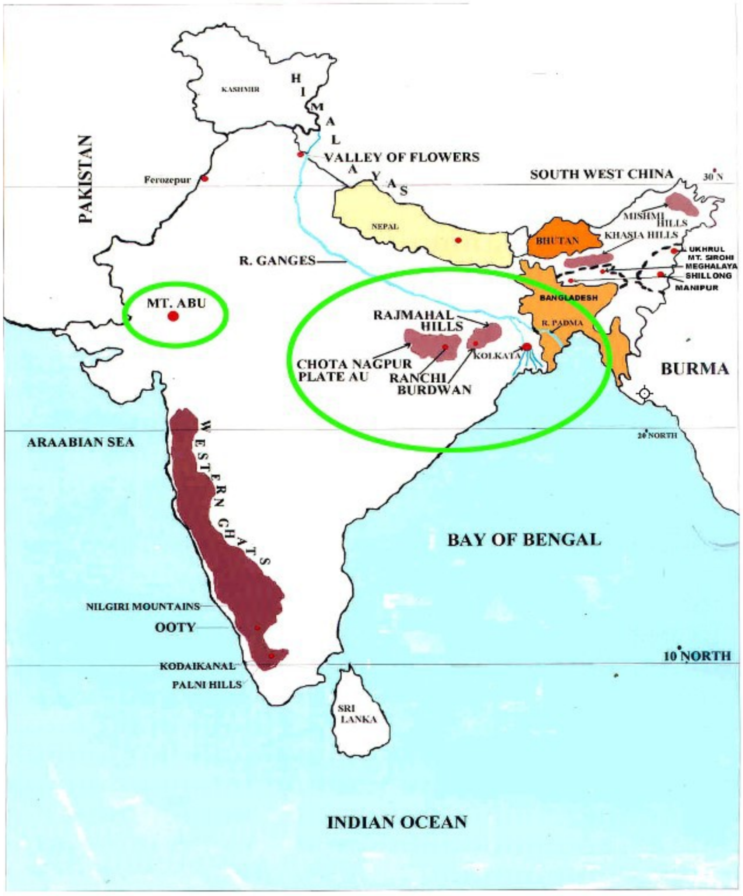
The Bengal form is, by any criterion, the most tropical form of this species. Its habitat is described, with eye-catching detail in the 'Himalayan Journals' of J. D. Hooker, the famous plant explorer who came upon this species when his explorations brought him from the foothills of the Himalayas to the plains of North Bengal, by the banks of a tributary of the River Ganges :

"*On the 7th of May (1850), about 80 miles in a straight line from the foot of the Himalaya, we found the stratified sandy banks, which had gradually risen to a height of thirteen feet, replaced by the hard alluvial clay of the Gangetic valley, which underlies the sand: the stream contracted, and the features of its banks were materially improved by a jungle of tamarisk, wormwood (Artemisia), and white rose bushes (Rosa involucrata, now called R.clinophylla), whilst mango trees became common, with tamarinds, banyans and figs. Date and caryota palms, and rattan canes, grew in the woods, and orchids on the trees, which were covered with a climbing fern (Acrosticum scandens), so that we easily doubled our flora of the river banks before arriving at Maldah'*

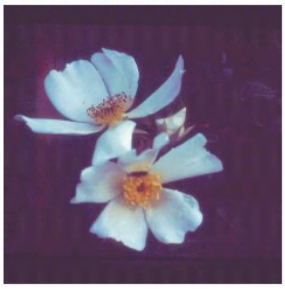
Expanding on Hooker’s observation we may point out that this species is typically found in flood plains and the islands of the Ganges, which are very often submerged during the monsoon rains.

In some ways getting a plant of this variant proved to be the most difficult of searches. Even in the late 19th century the species was characterised by the unusual feature of appearing in profusion where the swampy conditions suited, but again showing up very much further on – many apparently suitable habitats were completely bereft of the rose. With the rapid spread of agriculture, its habitat is under grave threat, but to our good fortune, the well known horticulturist of Bengal, Dr. S. Bannerjee, had collected a plant quite near where Hooker had observed it – at the point where the River Padma branches off from the main Ganges and flows towards what is now Bangladesh. In his tiny garden in Kolkata grew a solitary plant, perhaps the only one in cultivation when we began our search from 1967. It is rather extraordinary that even the Botanical Survey of India could not give us any information. Finally, in 1990, (after two decades!) Dr. N.C. Sen, rosarian of Asansol (in West Bengal) and our friend, was able to send us a plant, made from the original plant of Dr. Bannerjee.

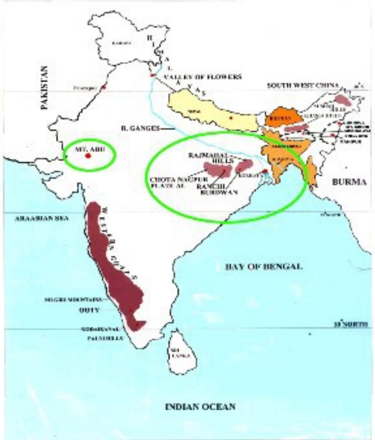
***R. clinophylla* Chota Nagpur form-habitat: warm dry climate**



Narender Singh of Ranchi would have found this form of clinophylla here



The Chota Nagpur form of *R. clinophylla* had reached us earlier. Mr. Narender Singh of Ranchi, also a rose enthusiast, while on a hunting expedition, had camped by the side of a forest stream in the Chota Nagpur Plateau of Bihar State. In the early dawn light he saw, to his surprise, a rose growing by the stream's side. He recalled our interest in *R.clinophylla*, and correctly identifying this rose, he sent us some cuttings, from which our first breeding work with this species began.



R. clinophylla sub tropical form at Mt Abu

Mount Abu Rajasthan

ount-Abu lake margin where we found the species

R.clinophylla- sometimes called *R.lyelli*

Bush of R. Clinophylla, Mount Abu form, growing on field boundary, Oriya Village, Mt.Abu. Note the size of the plant.

Rosa clinophylla - Mount Abu form

Looking for the 3rd form of *R. clinophylla*, the low mountain form, involved an expedition to one of the last reported findings of this rose on Mount Abu, rising to 1300 m., located, somewhat unpromisingly in the Thar Desert of Rajasthan State. The species was found here in 1888 by a George King. He gave no more details as to the location .So off we went to Mt. Abu and explored likely places, mainly the banks of streams, for several days without any success. Two additional problems made our search difficult. The State Forest Department had planted large areas with *R.multiflora*, which led to considerable confusion. The other problem was that, in the language of this area, Hindi, all roses are referred to as 'gulab' which refers to a pink rose, and we were looking for a white rose. Ultimately, we did what we should have done earlier- travelling around the forest with a local farmer, whom we met on the way and whom we persuaded to accompany us. Our somewhat reluctant guide proved to be much more knowledgeable than at first sight. He led us to some agricultural fields next to a lake, and lo and behold, the boundaries of the fields were planted with hedges of our rose.

There were even a few blooms to confirm the identification, though it was well past the main flowering period – it was mid-winter. There were many other bushes of the rose next to the lake margin and we were able to collect a few, as well as take photographs of the flowers. These were borne in corymbs, unlike the usual solitary flowers of the other two forms. But why does this form prefer slightly cooler habitat? We later read the observation of the noted Belgian taxonomist of the 19th century, M. Francois Crépin, who felt that this variant, also called *R. lyelli*, was probably a hybrid with *R. moschata.*

We now come to the various stages by which the garden roses were evolved starting from the original wild species.

Taking up *R. clinophylla* first, we would like to point out that genetically this species is very far removed from the modern garden rose. There is also the problem that *R. clinophylla* is a diploid and modern roses are tetraploid. Its only close relative is *R. bracteata*, which is a species of Myanmar and Southern China though well established in several places in India.

***R.clinophylla* in water**

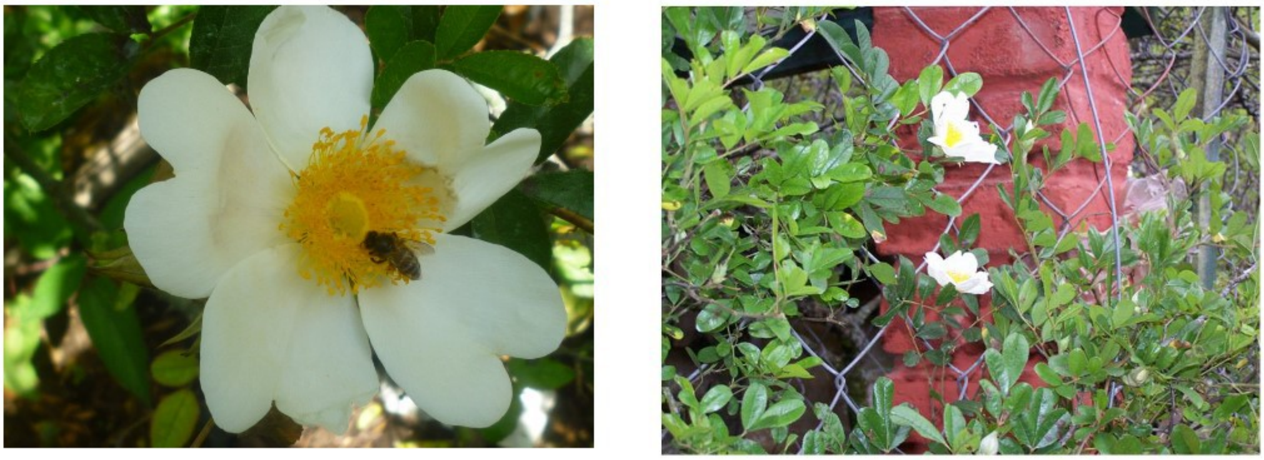
Mrs B.R.Cant x *R.clinophylla*

' PinkPink ' : Mrs B R Cant x (Mrs B R Cant x *R.clinophylla*)

First steps in breeding with *Rosa clinophylla*

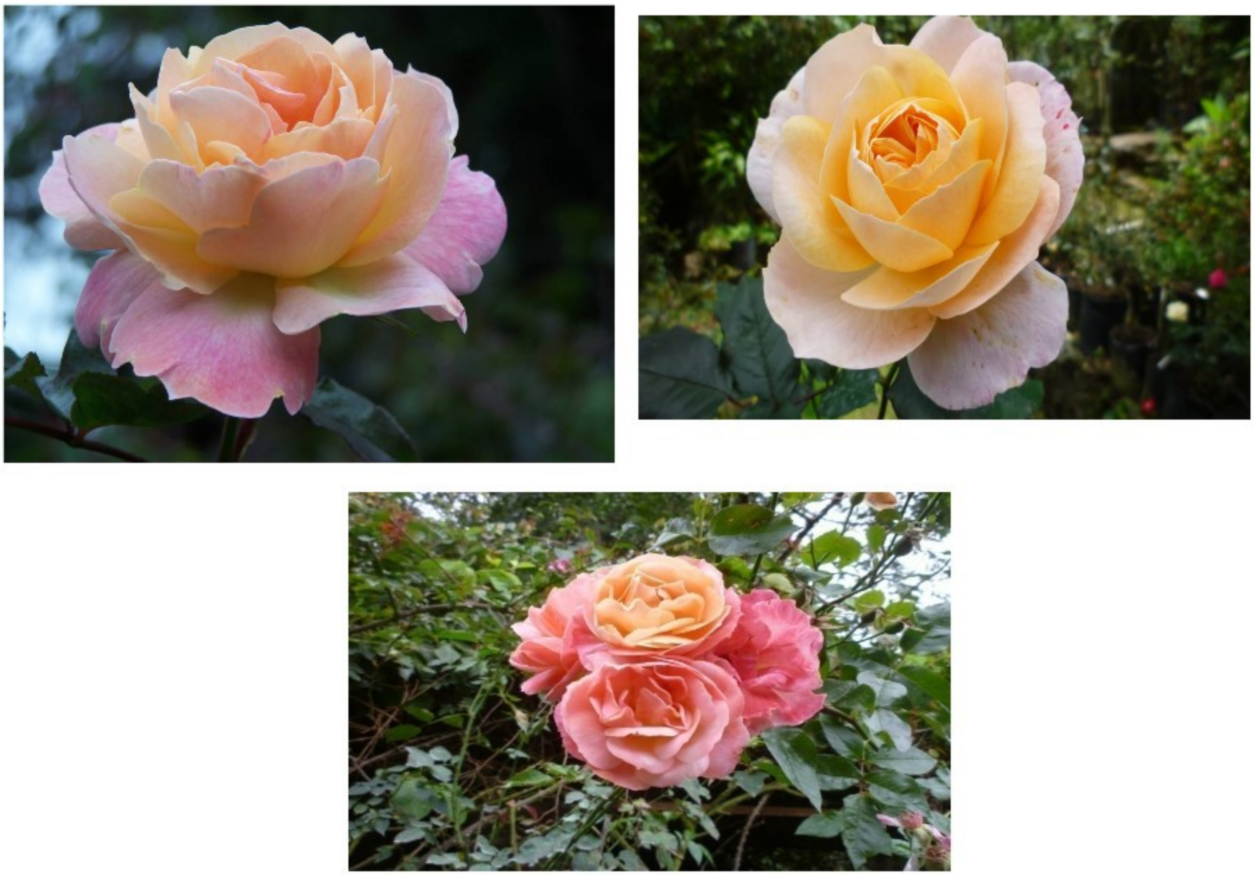
Two different approaches were adopted in this program. The first of these involved crosses with the well known Tea rose, 'Mrs B.R. Cant' which does very well even in the warm areas of India. The second was utilizing the floribunda 'Little Darling', a tetraploid which was extensively used by the great breeder, Ralph Moore, in his crosses with different roses, giving a clear indication that it was responsive to unusual pollen.

Taking up breeding with 'Mrs B.R. Cant' first, it proved extremely difficult to get viable seed from the cross ['Mrs B.R. Cant' x *R. clinophylla* (Bihar form)] – out of over 200 pollinations, less than 50 seeds were obtained, of which only two germinated. The first promptly perished, but we were lucky with the second one--initially rather weak, it however survived to produce single pink flowers which, surprisingly, repeated. A back cross into 'Mrs B.R. Cant' again resulted in a much more vigorous and fertile plant of the Tea rose persuasion in dark pink with semi-double flowers. This seedling, nicknamed 'Pink-Pink' figures in our various crosses at the diploid level.



(Rosa clinophylla x Rosa bracteata) - seedling

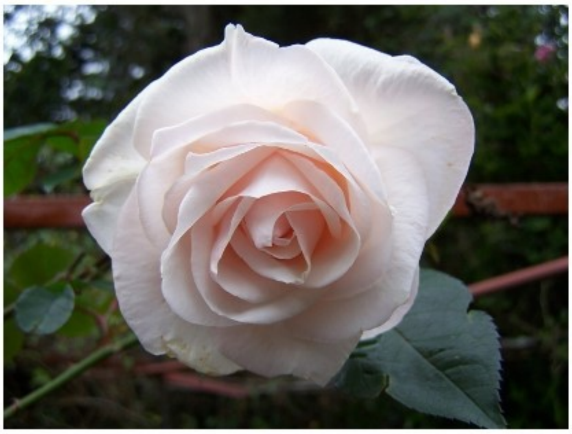
Work with 'Little Darling' was somewhat easier. We did not use *R.clinophylla* itself but a more vigorous hybrid of *R.clinophylla* and *R. bracteata*. The logic of this was that while as we mentioned earlier, *clinophylla* occupies a very moist habitat, *bracteata* prefers drier locations, so we felt that the hybrid seedling would be more adaptable to garden conditions. A large number of crosses were raised quite easily since the two species are closely related. We chose a very vigorous seedling which appeared to be half-way between the two parent species as our pollen parent for breeding with 'Little Darling', and from the resultant plants one appeared to have some promise, though rather weak, with pinky orange flowers but repeat blooming.



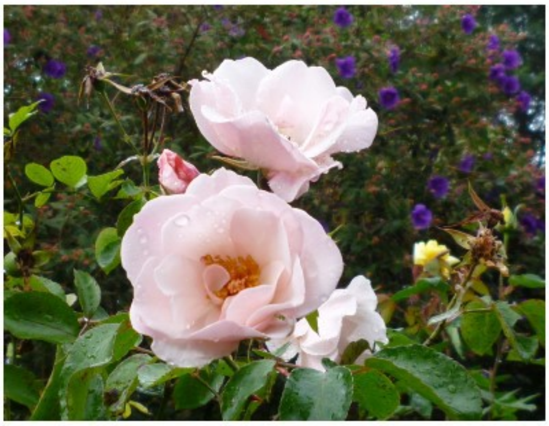
'E. K. Janaki Ammal' – a *R. clinophylla* – hybrid named to honor a great plant geneticist

We will take up our work using this seedling with ‘Little Darling’ first, as the program was easier. The first step was to cross this into a well known H.T. ’Montezuma’, which is well adapted to the Indian heat. From the cross came a fairly double orange rose, reasonably fertile and vigorous, code-named ‘Virmont’. Re-crossed into the yellow H.T. 'Landora' (Sunblest) produced ‘Landmont’ now released as 'E.K. Janaki Ammal' which was the starting point for a range of garden roses along with some similar seedlings, such as a cross between ‘Arthur Bell’ (yellow floribunda) and the ‘Little Darling’ derivative, (in an effort to introduce yellow colour), as well as a straight cross with the dwarf shrub ‘Bonica’. ‘Bonica’ has, as many of you know, several evergreen roses in its parentage and was introduced in to my breeding line in the hope that evergreen roses would result.

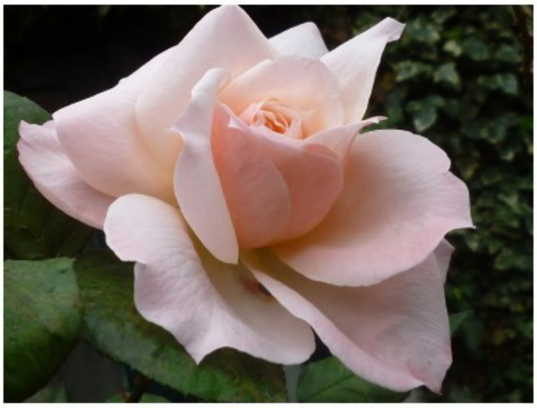
In this background two hybrids were introduced in 2005 – ‘Ganges Mist’ which is a vigorous fully double white flowered pillar rose with large flowers in the old rose form; and a white to creamy pink shrub ‘Silver Dawn’, result of inter-crosssing ‘Bonica’, *clinophylla* and the van Fleet climber ‘Silver Moon’. ‘Silver Moon’ was used in the hope that *R. laevigata* genes figured, as was thought, in its parentage. Unfortunately DNA analysis has shown that ‘Silver Moon’ has no *laevigata* genes.



GANGES MIST



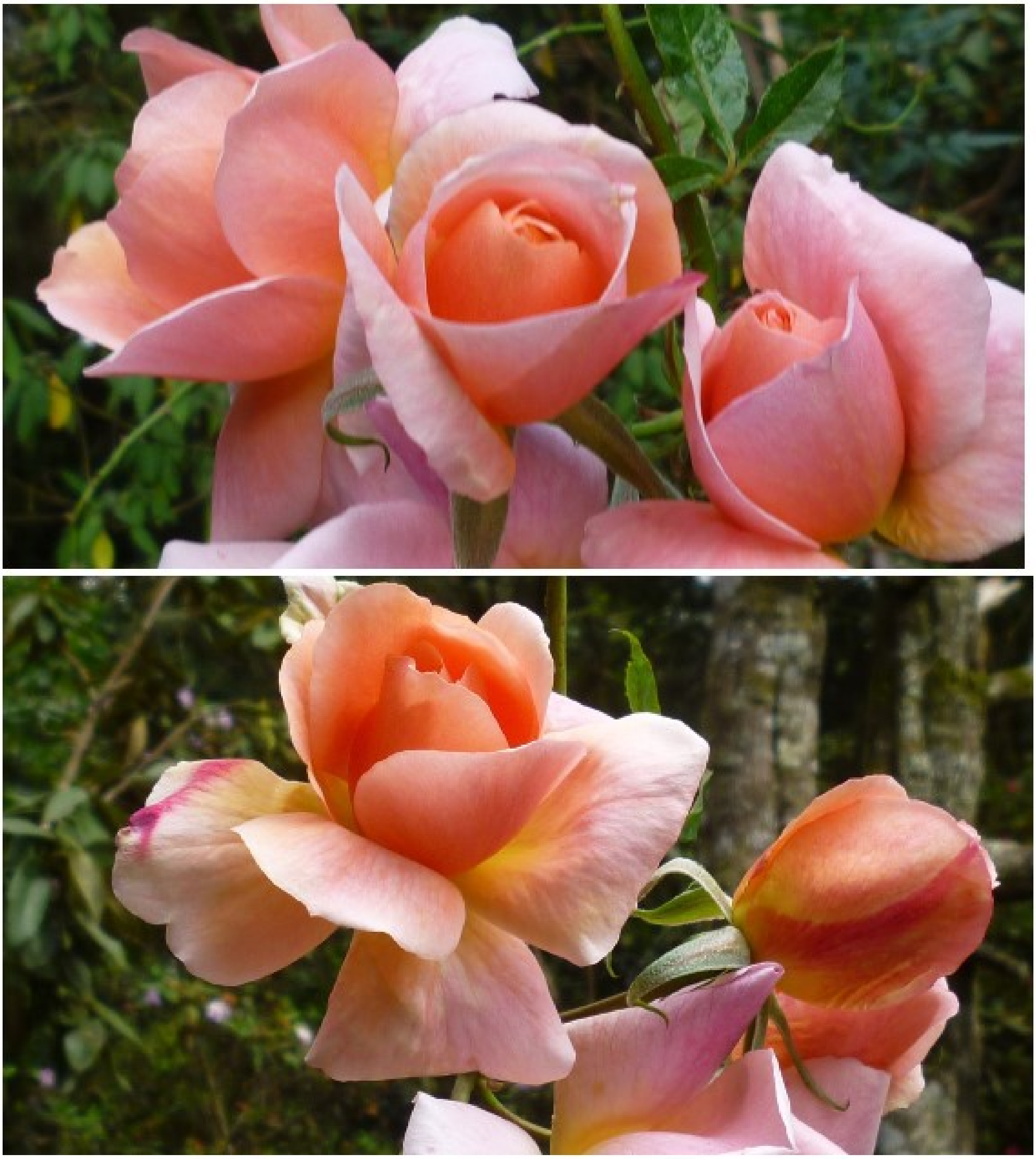
SILVER DAWN



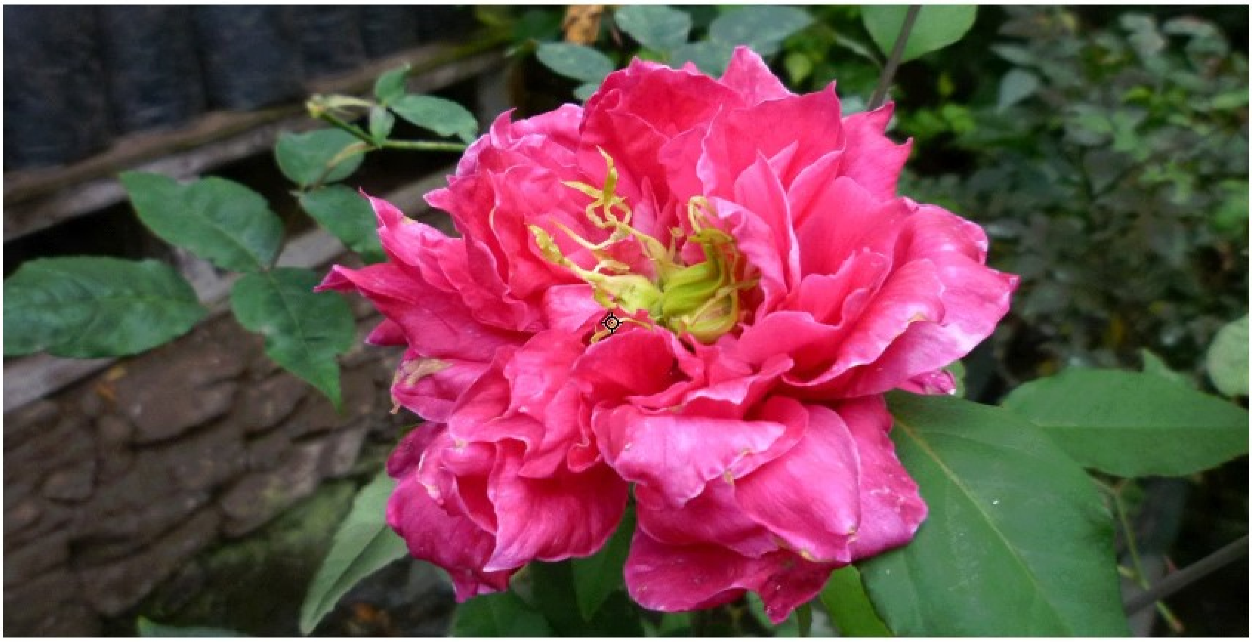
PAT HENRY - - NARENDER

Garden hybrids with *Rosa clinophylla*

The best of this series so far is the repeat flowering shrub ‘Pat Henry’ (‘Narender’ in India), resulting from a cross involving the yellow H.T. ‘Landora’ (‘SunBlest’ in the U.S) with ‘Virmont’ and ‘Ganges Mist’. ‘Pat Henry’ is a healthy plant bearing very fragrant flowers in shades of pink with hints of salmon orange. The flower which has H.T. form at bud stage, opens to old rose form. We speculate that the distinctive fragrance of this rose is the gift of *R. clinophylla*. There are many other roses in the pipeline but we do face a problem in testing for heat resistance, and more will be introduced once this is sorted out. A new release is ‘Takako-Tradition’s Torch’



VirPillar – The Future

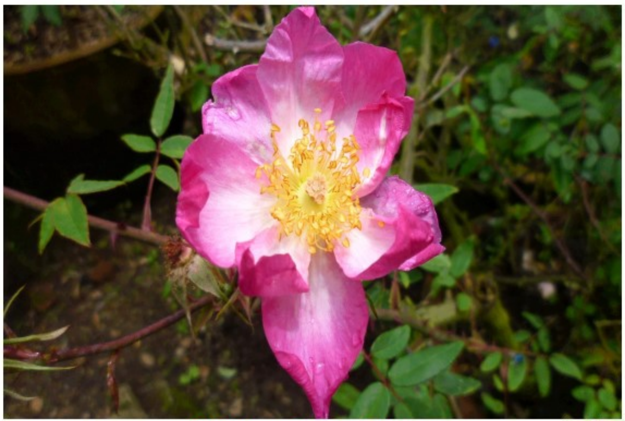


'Rêve d'Or' x 'Pink Pink' x 'Camelia Temple Rose' (China)

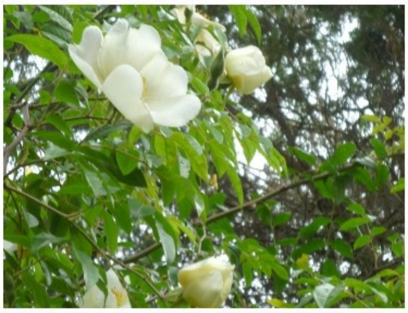
'Ganges Nymph'

Coming to the *clinophylla* line starting from 'Pink-Pink', an interesting result has been the appearance of several comparatively dwarf growing roses but with flowers of almost Tea rose size, arising from the cross with the Noisette, 'Reve d'Or' which does well in India. The first to be released from this group is 'Ganges Nymph', which has flowers of a very unusual form, reminiscent of *R.chinensis serratipetala*. The flowers have a very prominent green eye, which is attractive or not, according to taste.

Two other approaches in *clinophylla* breeding have also been tried. The first is to use a complex heat resistant seedling, which has the genes of 'Bonica' and some Tea roses as the seed parent, with 'Pink-Pink'. One result has been a dwarf healthy shrub which flowers freely in shades of pink with a white eye. The second approach is to use a species hybrid seedling of *clinophylla* x *gigantea* with other roses. One interesting result is a cross with 'Mrs B.R.Cant'. A further cross of this with the found China rose, 'Telengana Pink' has led to an elegant H.T. form climber which will be the basis of further work.

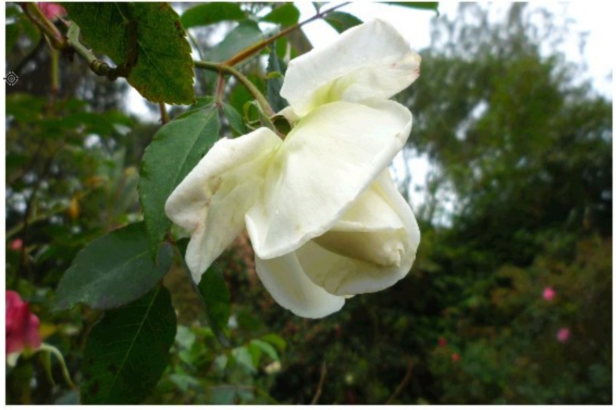


2.27 x Pink Pink

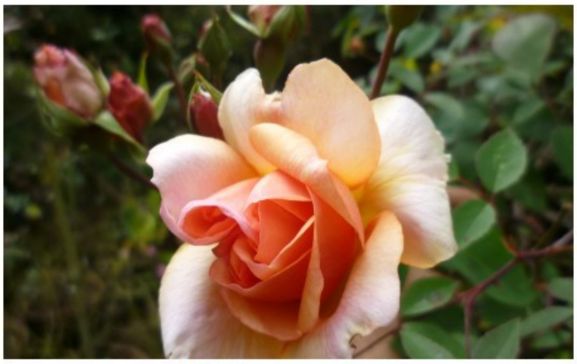


(*R.clinophylla x R.gigantea*)

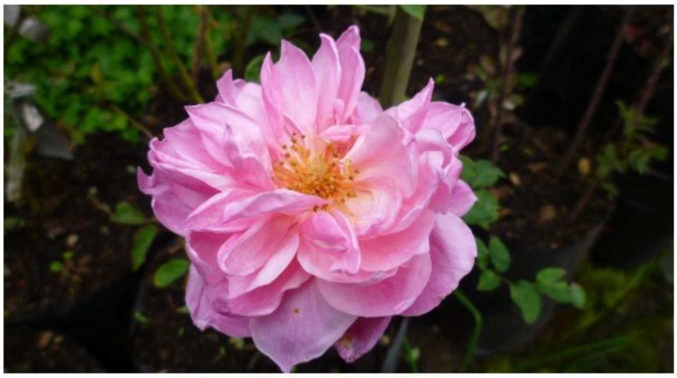
Telengana Pink(found China) x Mrs. B. R. Cant x (*R.clinophylla x R.gigantea*)



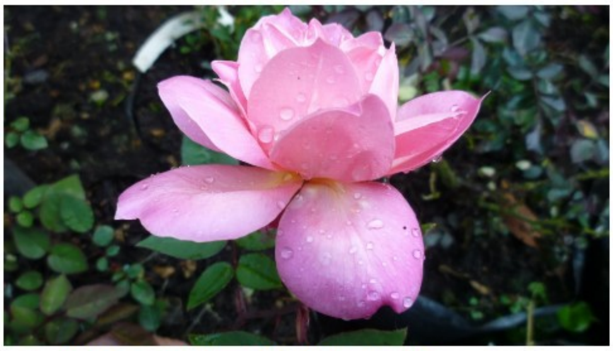
Two further diploid lines



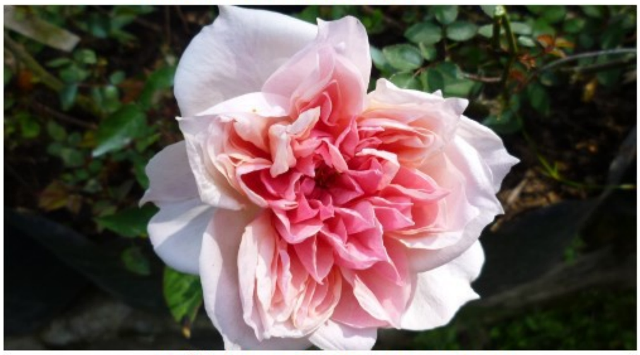
Apricot Patio Tea



Lilac Pink Patio Tea



Water Melon Pink Patio Tea



Old Rose Form Patio Tea

Dwarf cluster flowered patio Teas

Dwarf cluster flowered patio Tea seedlings

Amber Cloud

Manipur Magic

Sir George Watt

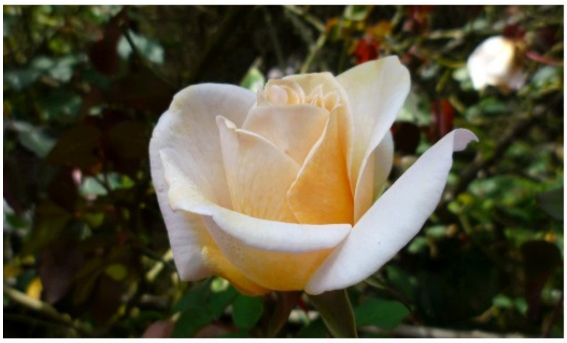
Sir Henry Collett

Diploid Gigantea-Hybrids

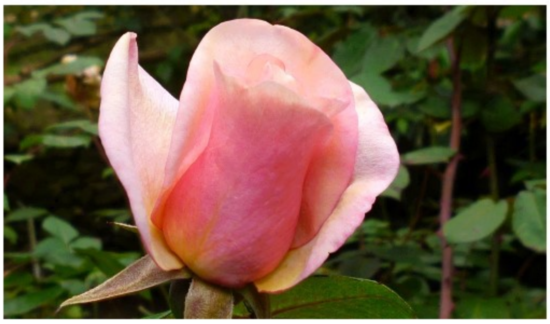
Work with *R.gigantea* has been somewhat easier as genes of this species are present in garden roses though perhaps remotely. Two types of crosses have been used. The first is crosses of *R. gigantea* with 'Rêve d'Or' mentioned earlier as doing well in India. The second is a cross of *R. gigantea* into the orange red H.T. 'Carmosine', which is well adapted to Indian conditions.

Early on we understood the unanticipated bonus of using *R. gigantea* in breeding – the H.T. form so loved by the majority of rose growers is the gift of this species. Crosses with 'Rêve d'Or' were unexpectedly successful as several climbers could be raised. These were generally once flowering though as the varieties matured some of them did repeat. One of the most interesting results was 'Amber Cloud' with real amber coloured buds and single flowers in cooler weather, and creamy yellow when it got hot. One of our friends wanted this rose to be called Golden Gigantea, which gives an idea of how this plant performs. 'Amber Cloud' has been admired both in southern USA and southern Europe. Another important seedling with the cross with 'Rêve d'Or' is 'Manipur Magic', a fully double light yellow rose looking uncommonly like 'Maréchal Niel' on steroids. This is a vigorous climber with lovely bronzy green foliage as an added attraction.

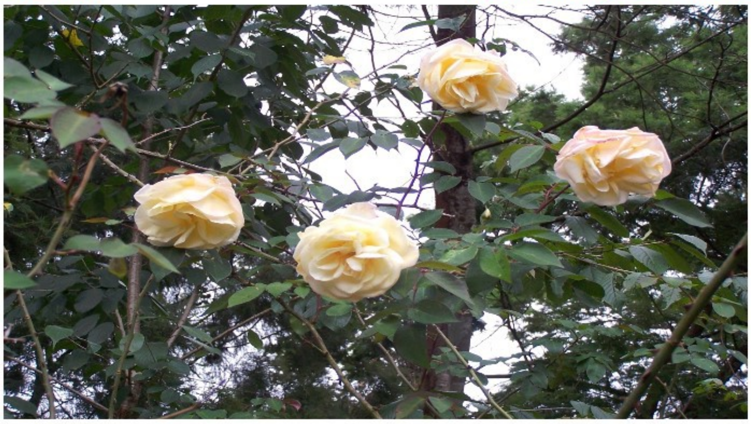
Two sister seedlings with double flowers, one creamy yellow with a much darker yellow base and the other, ivory, were named 'Sir George Watt' and 'Sir Henry Collett' to honour the two plant explorers who discovered *R. gigantea* in Manipur and Myanmar.



Maebara's Dream



Frank Kingdon Ward



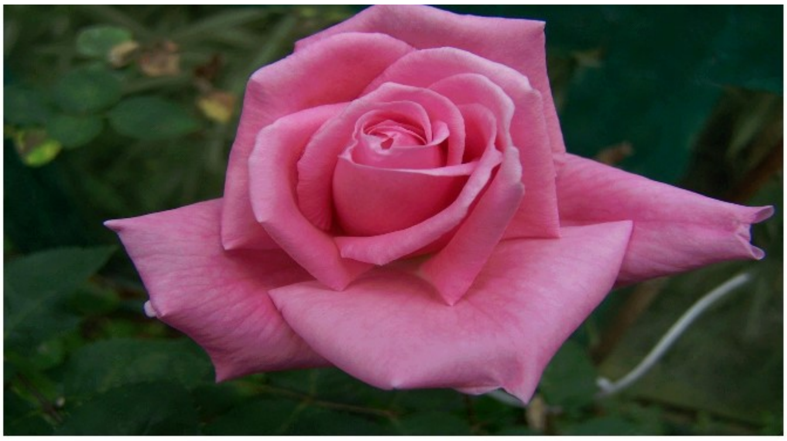
Evergreen Gene

First hybrids of R. gigantea – triploid / tetraploid group

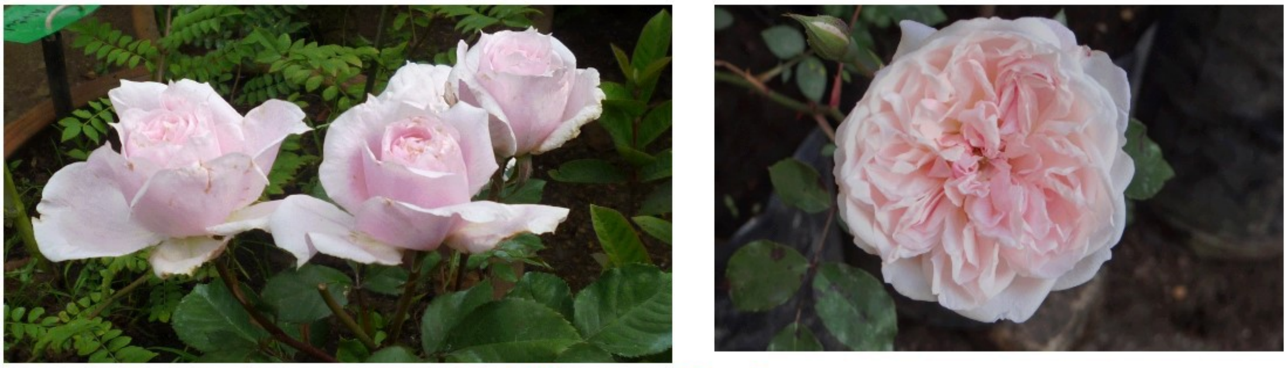
Coming to the crosses with ’Carmosine’ we were lucky that the lovely broad petals of this rose were inherited by the crosses. One of the most charming, with beautiful H.T. form flowers in shades approaching the colour of ‘Lady Hillingdon’ was named 'Maebara’s Dream’, as a token of our appreciation for the great encouragement we had received from Katsuhiko Maebara, the guiding spirit behind the Sakura Heritage Rose Garden near Tokyo, Japan.

A second seedling with very large H.T. form flowers in apricot yellow to creamy yellow was introduced as ‘Evergreen Gene’ to honour or friend Gene Waering of USA who does so much to popularize the idea of evergreen roses for warm climates.

The third of the series is a spectacular yellow and pink climber called ‘Frank Kingdon Ward’ after the great plant explorer who rediscovered *R. gigantea* in the mountains of Manipur.



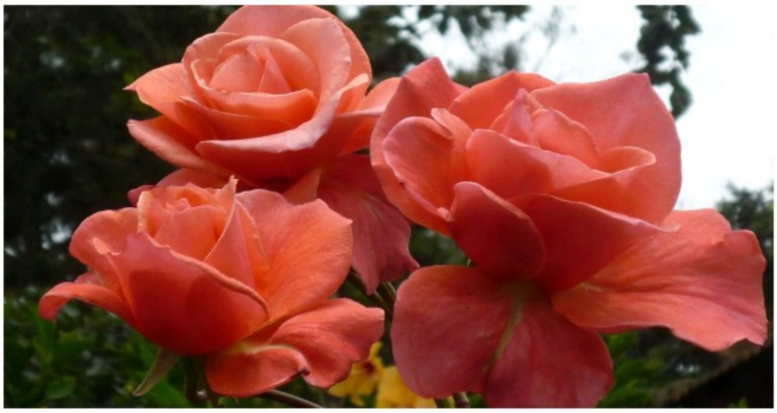
Naga Belle



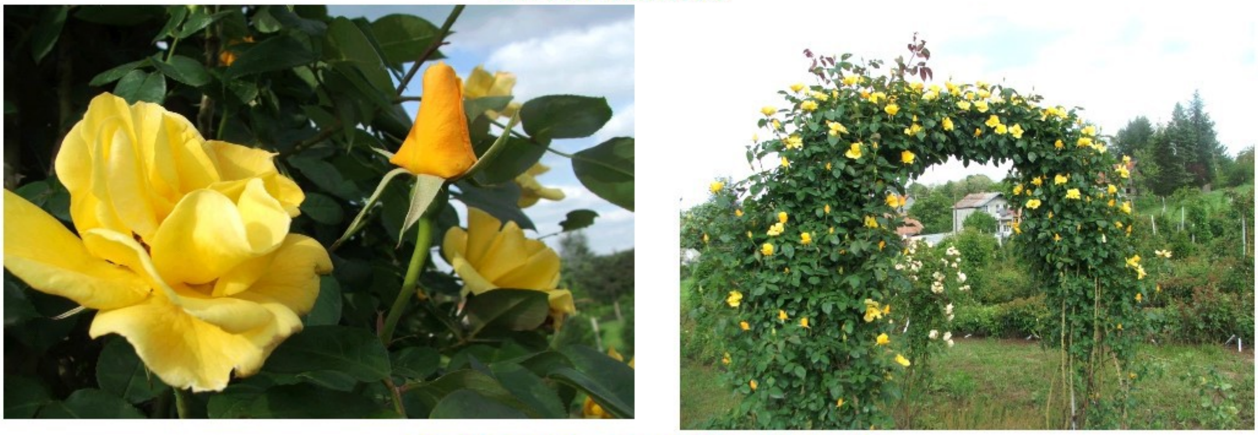
Allegory of Spring

Newer hybrids of R. gigantea – Repeat Flowering Shrubs

Meanwhile we made the interesting observation that the well known rose ‘Carefree Beauty’, bred by Griffith Buck of the U.S. for cold hardy climates, had, additionally, the quality of being well adapted to heat. A cross of ‘Carefree Beauty’ with ‘Maebara’s Dream’ produced the shocking pink, repeat flowering H.T. form shrub with comparatively restrained growth for a gigantea (only around 5 feet) named ‘Naga Belle’, named for the Naga tribe of Manipur area. A similar cross of ‘Carefree Beauty’ and ‘Evergreen Gene’ led to ‘Allegory of Spring’ with delicately beautiful H.T. form flowers in shell pink opening to old rose form, again repeat flowering.



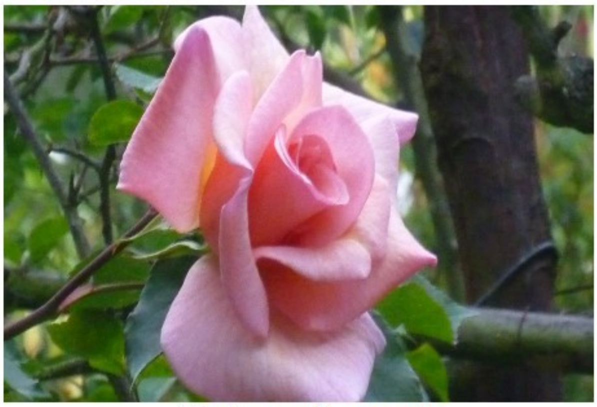
Sirohi Sunrise



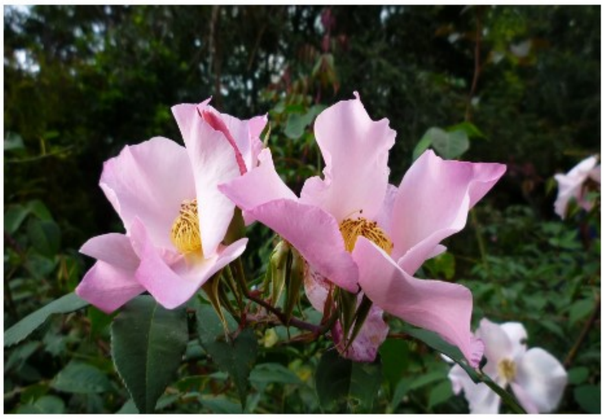
GoldenThreshold (in Serbia)

More hybrids

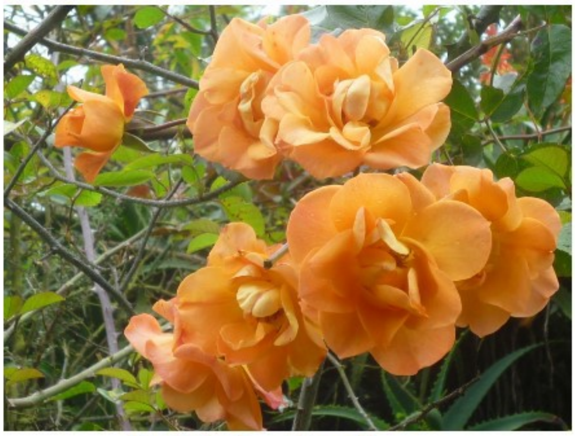
The use of the floribunda ‘Brown Velvet’ with ‘Maebara’s Dream’ produced ‘Sirohi Sunrise’ a pillar rose with browny orange blooms, which in turn crossed with ‘Golden Showers’ led to ‘Golden Threshold’, a compelling shade of dark yellow with anthers of brown verging on chrysanthemum crimson. This climber performs well in many parts of the world. I show you a photograph taken in Serbia.



“Sakura Sunset”



“Rebecca’s Choice”

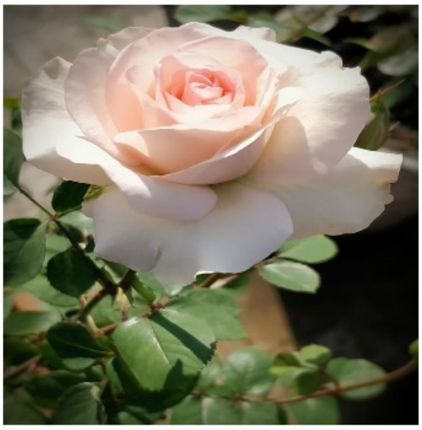


“Karrie’s Rose”

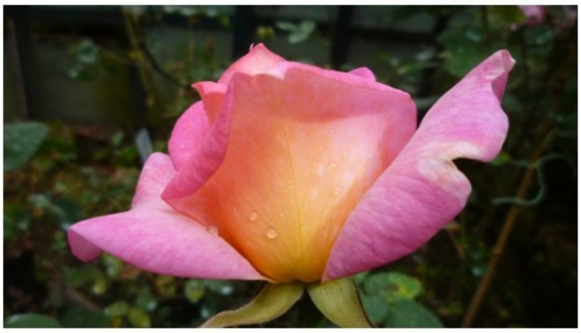
Further Crosses with climbing Giganteas

Used in further crosses ‘Golden Threshold’ and other climbing giganteas are yielding several new climbers in different colours ('Karrie’s Rose', 'Mia Grondahl' etc) and also a range of shrub roses in eye catching colours. Many other hybrid *giganteas* using different combinations of modern roses with our *gigantea* strains are in the pipe line. We show you some Hybrid Giganteas of the shrub group.

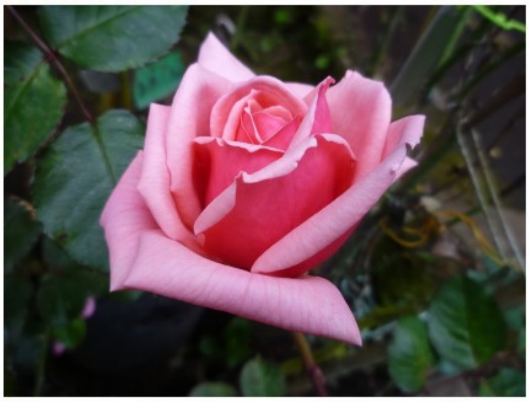
- Repeat flowering Gigantea shrubs: 'Kindly Light', Dr. N.C. Sen', 'Rose Manju', 'Agnimitra', 'Allegory of Spring', 'Helga's Quest', 'Adrianna Zarri', 'Churachand', Pink Prelude', 'Emina'
- Repeat flowering Gigantea shybrids: 'Alister's Gift', 'Lanjique Rose', 'Out of India', 'Remembering Nico'



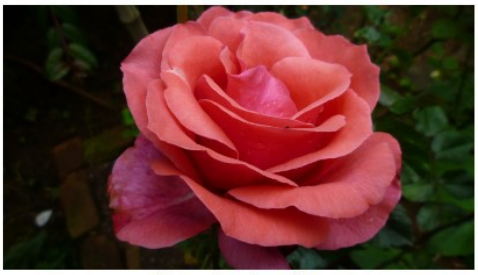
“Kindly Light”/ “Swami Vinayananda”



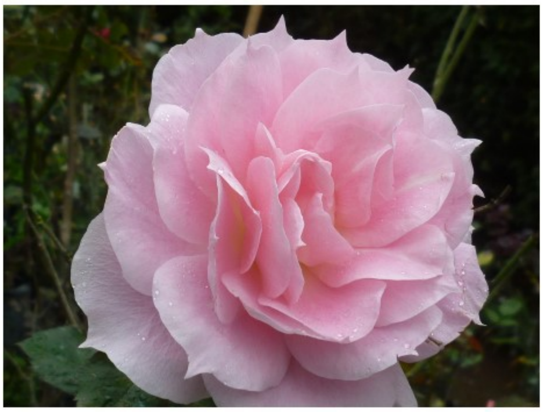
“Maria Cecilia Freeman”/ “Dr. N.C.Sen”



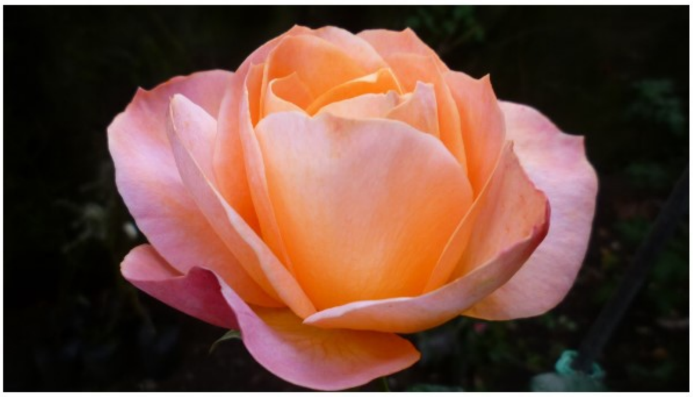
“Dr.Malcolm Manners”/ “Rose Manju”



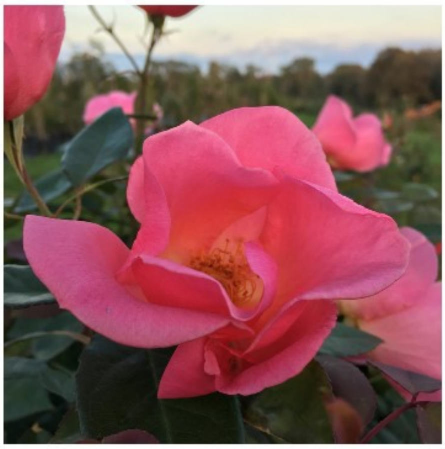
“Agnimitra”

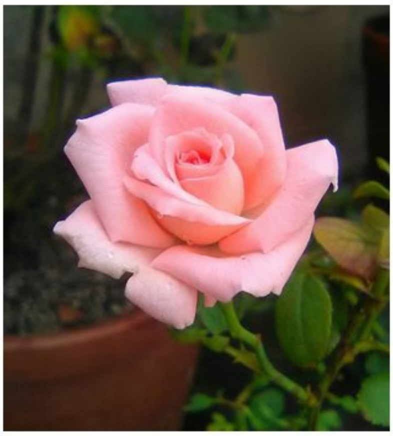


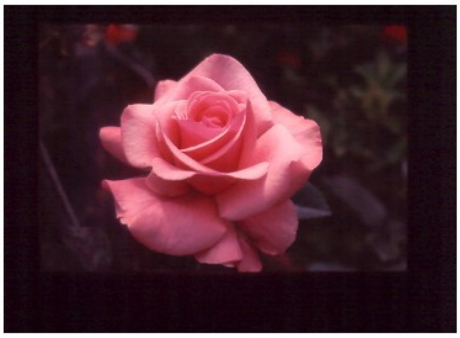
“Allegory of Spring”

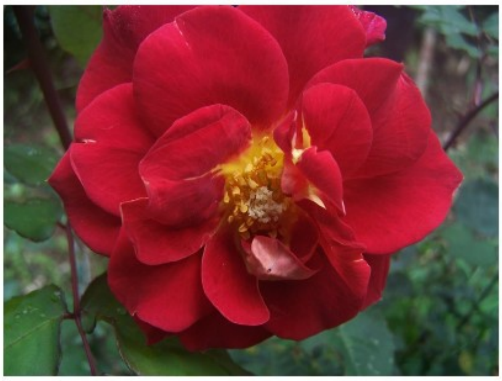


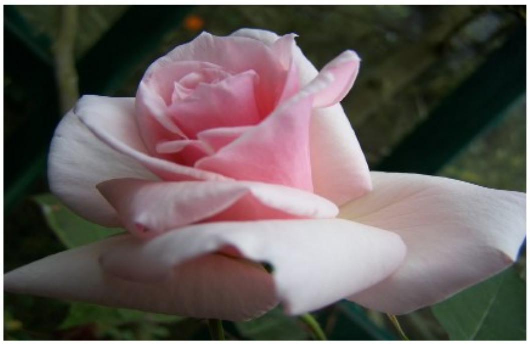
“Helga’s Quest” / “Vishnupriya”

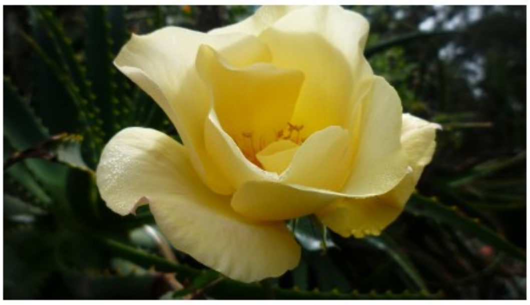

"Adrianna Zarri"

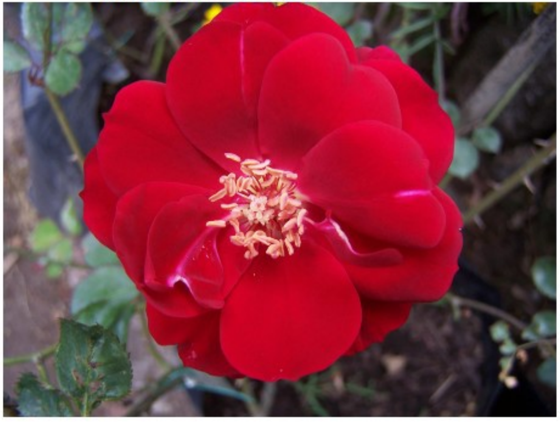

"Churachand "

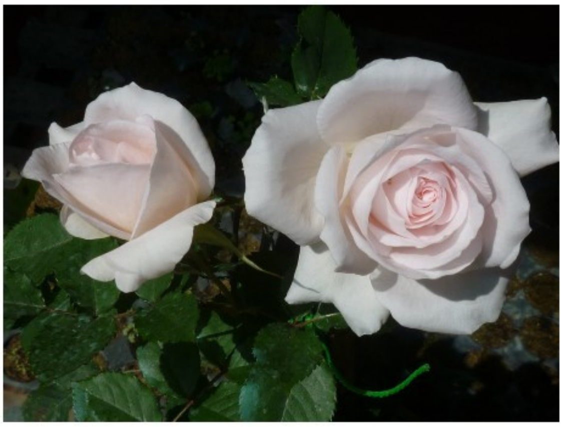

"Pink Prelude"


"Emina"

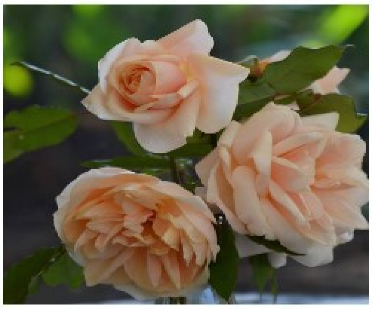

ALISTER'S GIFT


LANJIQUE ROSE


OUT OF INDIA

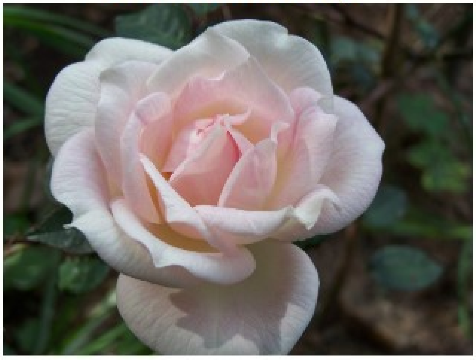

REMEMBERING NICO

As many of you are aware the Tea roses are closely connected with *R. gigantea* and it is no surprise that several new Tea roses have been hybridized arising from the same type of crosses. One of them is 'Faith Whittlesey' which does well in warm climates, another is the shell pink with a hint of apricot 'Lotus Born', 'Aussie Sixer', apricot yellow has been named in honour of the six Australian ladies who have written the new classic book on Tea roses. We show you pictures of these as well as other released Tea roses.

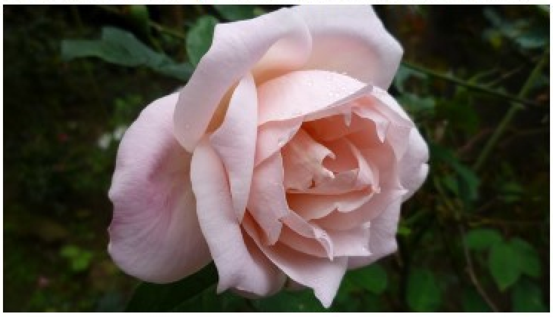


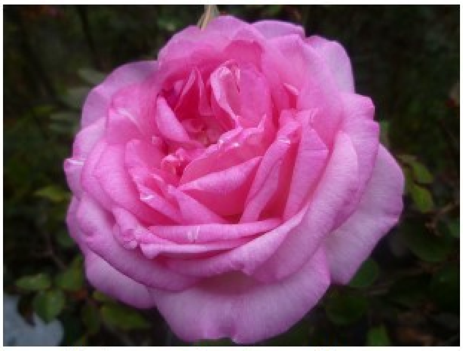
"Aussie Sixer"

"Faith Whittlesey"

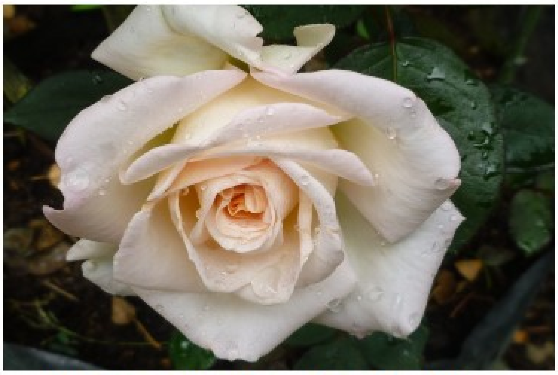


"Lotus Born"/ "Padmasambhava"



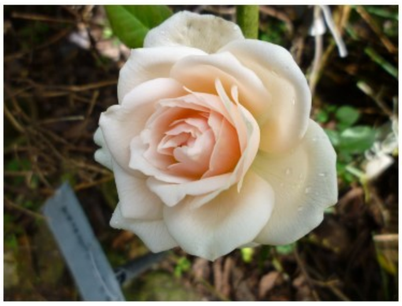


"Maura la Cava"

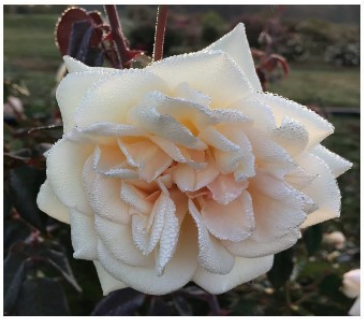


"Remembering Cochet"

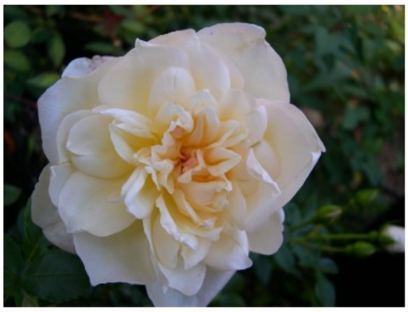
Tea Roses



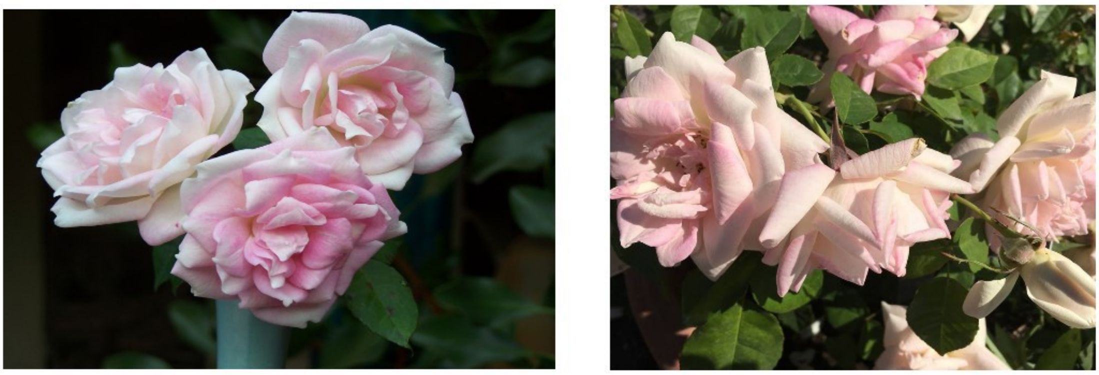
KRISHNA'S PEACH



"APRICOT TEA"

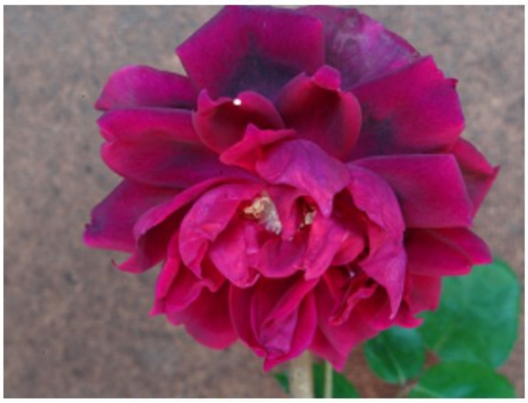


DIXIE BEAUTY

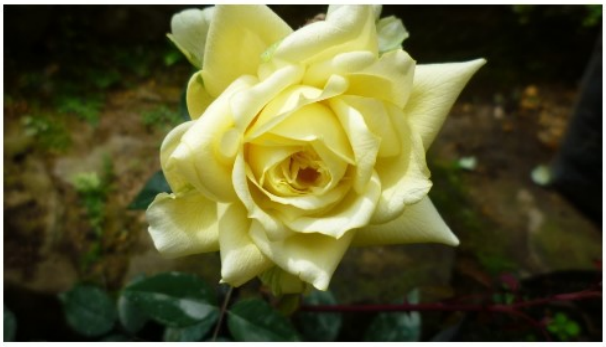


GARNET CREST

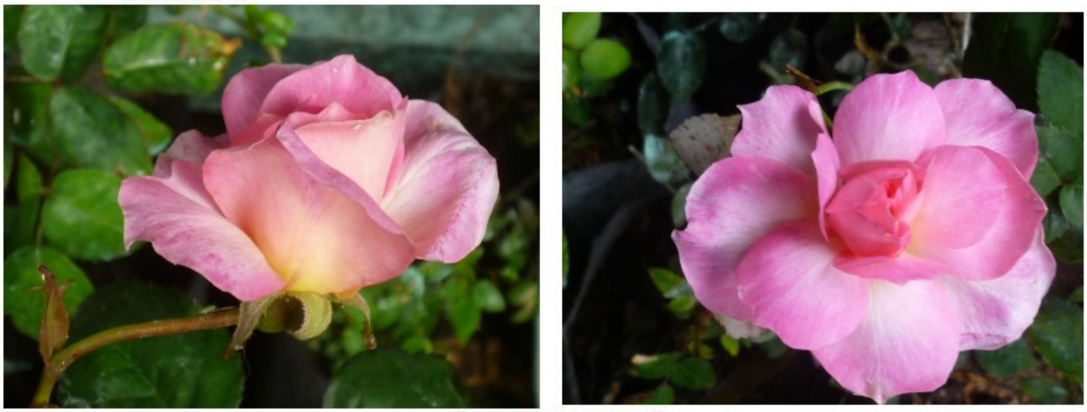
Tea Roses



"VIRLOUIS"



"VIRREVE"



"VIRBRABANT"

NewTea Roses

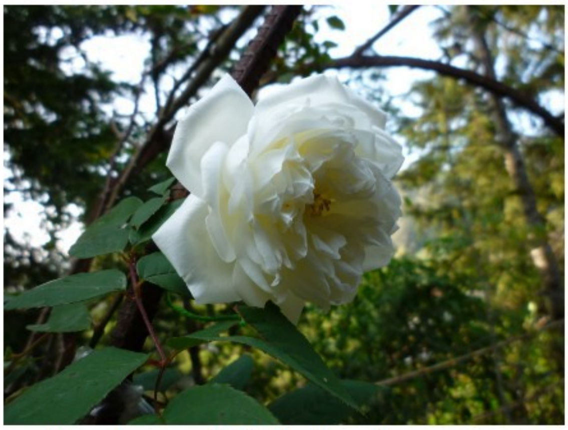
Among the new Teas/Chinas which are still under cultivation are some of ‘different’ colours. One of the most distinctive is ‘VIRLOUIS” with flowers of darkest red with purple edges. Another is “VIRREVE” (Rêve d”Or x Aussie Sixer) and a third is an interesting combination of 'Duchess du Brabant' with *R. clinophylla*. We show you pictures of these.

LAEVIGATA ROSEA

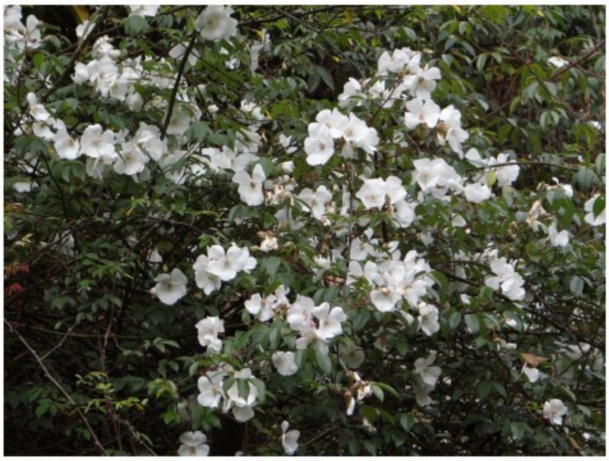
“Rose Legend Akira Ogawa”

The charme of Single Roses

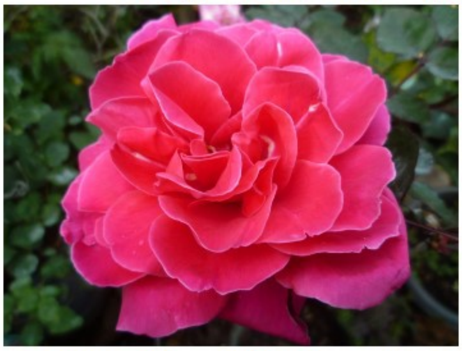
In conclusion we would like to appeal to younger rose breeders to take up the challenge of creating better roses for warm climates. The future belongs to those who take this up seriously



'Leschenault de la Tour'
(R. leschenaultia hybrid)



'Lady Jane Hooker' – (R. longicuspis X R. gigantea)



'Lyndy’s First Love' (R. Edward hybrid)

Rose

Article for the book

'Ornamental Horticulture in India - A Dr. B P Pal Souvenir'

1986

M.S. Viraraghavan
Hill View, Fern Hill Road Kodaikanal,
Tamil Nadu

> "Oh no man knows Through what wild
> centuries Roves back the rose."
> *Walter de la Mare*

This familiar quotation has a special relevance when we write of roses in India. Dr B.P. Pal, quoting Bassity, refers to a charming Hindu legend, according to which, when Vishnu came down to earth and was bathing in a pool, a lotus blossom opened, out of which stepped Brahma, who, pointing to the lotus, claimed it to be the most beautiful flower on earth. Vishnu, while agreeing to its beauty, invited Brahma to his own Paradise, Vaikunth, where he pointed to a rose bush in a beautiful bower—there was just one flower, pale as the moon with perfume so sweet that Brahma bowed his head and admitted, 'This is the fairest flower that grows'. There can be no doubt that roses would have been well known in ancient India as several wild species are to be found in the Himalayas, and Vaikunth, at least according to one version, is Mount Meru, a mountain to the north of the Himalayas. The poets of ancient India, especially Kalidasa, circa AD 400 were undoubtedly fascinated by the scenery of the Himalayas and the beauty of the wild rose would surely not have escaped notice.

But when did rose cultivation begin in the plains of India? To this there is no clear answer. B.S. Bhatcharji, the pioneering Indian rose hybridizer with more than a trace of patriotic fervour, says that *Rosa chinensis* (or the China rose) should really be *Rosa indica semperflorens,* relying on the observations in Dr Jules Hoffmann's work on roses published in Germany (English translation, 1905). He also disputes the fairly common assertion that the original name of Bengal rose or *Rosa bengalensis,* used for the early rose introductions from China, was a mistake arising from the fact that roses were brought to England and France by the ships of the East India Company, which passed through Calcutta. Quoting Dr Hoffmann further, he asks, 'Where were the ships of the East India Company when roses from India and Persia reached the Greek and Roman Empires? In other words, Bhatcharji implies that roses from India had reached Europe much before the days of the East India Company.

Without entering into this controversy, it is clear that certain types of roses were cultivated in India for many centuries. Even an authority like Firminger refers to the common China, 'Musk' and the 'Bussorah' ('Damask') rose as being cultivated in India prior to the introduction of various types of Tea, Noisette, and Hybrid Perpetual roses from Europe towards the end of nineteenth century. But, as Dr Pal points out, authentic information on rose growing in India is available only from the days of the Mughals.

INDIAN SPECIES

Several rose species, as stated earlier, grow in the Himalayas. Among these are *R. webbiana,* characteristic of the dry Kashmir and Western Himalayan belt, and the moisture-loving *R. gigantea,* which is found in the extreme eastern portion of the range, especially in Sikkim, Meghalaya, Manipur and contiguous areas of Burma and South-West China. The beauty of *R. gigantea* is described in ecstatic terms by the well-known authority Graham Thomas, who refers to the tremendous stature of the plant (12 m or more), the strong shoots and the hooked prickles with large elegant drooping leaves and giant lemon-white silky flowers 12.5 cm across. This rose is of great interest as it is one of the parents of the Tea rose, probably contributing to that class the pale yellow flavonoid pigments and the long elegant petals. In passing, we may note that this goes to support Bhatcharji's contention referred to earlier that Tea roses are as much Indian as they are Chinese. More recently the species was used to raise a series of climbers adapted to the Australian climate by Alitair Clarke of Melbourne— 'Nancy Hayward', 'Lorraine Lee', etc.

Other interesting wild roses of the Himalayas are two members of the Musk rose complex *R. brunonii* (is this the white rose of the Vishnu-Brahma legend?) found in Nepal and the Garhwal areas of the Himalayas, and *Rosa longicuspis,* found in the Khasia and Mishmi Hills of eastern India. Both of these giant climbers have that most attractive characteristic of the Musk rose—the capacity to waft fragrance in the air. The third member of the Musk roses is the southern *R. leschenaultiana (R. moschata leschenaultiana)* which is found in the Nilgiri and Palani Hills of south India. Other wild roses found in the Himalayas include the pink *R. macrophylla,* the lilac-pink *R. webbiana,* as well as the four-petal white-flower *R. serica.* Some historically important roses are also semi-naturalized, *R. foetida,* the golden yellow rose of Iran found in the similar climatic belt of Kashmir as also the Afghan *R. ecae,* with bright yellow flowers apparently used as hedges around Kargil in Ladakh.

Perhaps the most important of India's wild roses is the tropical *R. clinophylla (R. involucrata)* which is described as growing throughout the Indian plains, especially in the plains of Bengal, near streams and marshy places. If crosses could be made with this white-flower semi-climbing rose which is clearly well adapted for warm climates we would have made a tremendous advance in rose breeding in India.

No doubt the wild roses of the country are the most authentic of Indian roses, but the following description will concentrate on roses hybridized in India.

PIONEER HYBRIDIZERS AND THEIR ROSES

The most prominent of early Indian hybridizers is undoubtedly B.S. Bhatcharji, owner of the rose nursery P. Bhatcharji & Sons; sadly no more in existence. In fact it is difficult to exaggerate the importance of the work done by B.S. Bhatcharji and his sons, S.M. Bhatcharji and A.M. Bhatcharji. The Bhatcharjis were probably not India's first hybridizers; that honour belongs to one B.K. Roy Chowdhary, a nurseryman in the Santhal Parganas, who in 1935 raised the variety 'Dr S.D. Mookerji'.

But during 1956-1966 to 1967, the Bhatcharjis raised several hundred rose varieties (Hybrid Teas, Floribundas, and a few climbers) out of which 125 are listed in Dr B.P. Pal's book entitled, *The Rose in India.* There is, however, a certain discrepancy in the dates, as Shri B.S. Bhatcharji in the Preface to the second edition of his book, *Rose Growing in the Tropics* published in 1959, states that his attempts to raise new roses suitable for the tropics are being continued for nearly a quarter century. Undoubtedly, he must have been prominent at an earlier date for, as far back as 1933 a rose 'B.S. Bhatcharji' was introduced by the famous firm, A. Dickson & Sons of the U.K.

Numbers apart, what is most significant is that the elder Bhatcharji was perhaps the first Indian to recognize that we require a separate line for breeding in the warm tropical climate, and pursued this objective with sustained vigour. Readers will be interested to know that roses raised by Bhatcharjis were exhibited as 'Roses from India' at the 1958 International Rose Conference in London; and one of their roses 'Sister Nivedita' was catalogued by the English firm, Frank Cant & Sons in 1962 or 1963. In fact he had the vision to send a large number of varieties for trial during the late fifties to Frank Cant & Co., U.K., who placed quite a number of these varieties in the Royal National Rose Society Trial Grounds. Sadly, but as could be expected, these roses selected for good performance in the warm climate did not fare well under English conditions. In a way confirming the validity of the concept that a rose selected for good performance in the warmer areas, could hardly be expected to perform well in a cool moist climate, though many appeared promising whenever the weather there was favourable. The point is to this day of great relevance, for

Indian rose fanciers still feel that new rose varieties imported from the West are virtually the only roses worth trying out, forgetting that the converse is equally correct.

"Today the foreign researchers are creating winter hardy roses to cater to the rose fanciers of the cold zones. Such varieties produce a wealth of blooms in such a climate which is cooler in temperature" (during summer) "than the winter in even most parts of North India, not to speak of South India. The great majority of such winter hardy roses are very unhappy in tropical warmth" write the Bhatcharjis in the introduction to their 1963 catalogue.

As Dr B.P. Pal points out in his recent book, 'Survey on Rose Breeding in India', there is unfortunately not much information available on the parentages of the Bhatcharji roses, nor the various types used by them in their endeavour to breed warm climate roses. But, having grown a fairly large number of their productions, we may speculate that judging by appearances, many of the older Hybrid Perpetuals were used in their breeding programme, in a search for fulness and stiff stems; some of the *chinensis* varieties, including 'Cecile Brunner' (the influence of 'Cecile Brunner' is quite evident in varieties like 'Muktadhara', a satin pink Floribunda, 'Toohin' white Floribunda); and some of the Tea roses. If we look at one of Bhatcharji's famous roses, the apricot Hybrid Tea 'Raja Ram Mohan Roy', and his later production, 'Tilottama', in the same colour range, the influence of the Tea roses of the 'Lady Hillingdon' type is apparent.

Among the well known Bhatcharji roses which are still available are the red Hybrid Tea, 'Heart Throb', with huge but elegant blooms of the richest crimson scarlet and fragrance to match, 'Raja Ram Mohan Roy', with blooms in lovely shades of bronze apricot on a strong bush, and Floribunda, 'Pandit-Nehru', with medium-size blooms in the orange scarlet range. Other popular Bhatcharji roses include the very fragrant red Hybrid Tea, 'Sugandha' which is pictured in the stamp released on the Rose Day recently by the Posts and Telegraphs Department as also the dark black-red Hybrid Tea, 'Kalima'.

In fact B.K. Roy Chowdary and A.K. Roy Chowdary are apparently the only other iwo prominent rose-breeders who raised new roses in the period 1960 or earlier.

ROSE BREEDING IN THE SIXTIES

With the decline of the Bhatcharjis by the beginning of 1960s a fresh impetus was given to rose breeding on what may be called a three-pronged front: by amateurs; by Government research institutions; and by professional nurserymen.

Dr B.P. Pal, the then Director of IARI, decided to take up rose-breeding at a personal level, towards the end of fifties. Because of which, apart from his personal interests, Dr Pal was able to provide a very powerful stimulus to the production of new rose varieties by the IARI. Rose-breeding being what it is, partly science and partly art, readers can easily understand what a difference it would make if the head of a government research institution is himself an imaginative rose breeder.

About the same time work on rose breeding at the nurseryman level started with the emergence of Sri G. Kasturirangan, owner of the renowned firm of K.S.G. Sons, Bangalore. In nutshell, the decade saw great progress on all three fronts.

In a series of five articles published in the *Indian Rose Annuals* of 1980, 1982, 1983 and 1985 (yet to be printed), Dr Pal has furnished a full account of his work in rose breeding. In his latest article scheduled for publication in the forthcoming *Indian Rose Annual,* he states that his rose breeding has not been based on any long-term programme. "My modest aim has been to try and evolve garden varieties suitable for climates like Delhi with extreme variations in climate". The latter statement (perhaps understandably) hardly does justice to Dr Pal's unique status as a rose breeder. Here, may be for the first time in the history of rose breeding, we have an eminent scientist with the highest qualifications in Genetics and Plant Breeding, with decades of practical experience in wheat breeding, and an equally long fascination with rose growing, involving himself with breeding roses as an amateur. But. . . there is yet a third factor—the artist's sensitivity to form and colour which was simultaneously brought to bear on his work.

In his earliest work, Dr Pal started with open-pollinated seeds of the popular variety, 'Gruss an Teplitz' among the seedlings was a crimson Floribunda with fragrant flowers which was released as 'Rose Sherbet'. A little later, in 1962, came the recognized pink Floribunda, 'Delhi Princess', which exhibits exceptional vigour and bears cerise red to warm pink flowers in great profusion. This variety has been extensively used by the IARI in its plant-breeding programme; in raising the dark red 'Bhim' and the Chinese yellow Hybrid Tea 'Vasanth'.

One of the earliest Hybrid Teas raised by Dr Pal was the white 'Dr Homi Bhabha', a seedling of 'Virgo' (1967), and to this day it remains perhaps the best white Indian-raised Hybrid Tea. Among the other Hybrid Teas raised during the sixties may be mentioned the lovely 'Kanakangi', a seedling of 'Mme. Charles Sauvage', which attracts the eye with its rich shades of apricot yellow; the creamy yellow 'Poornima', a seedling of 'Farnand Aries', with extra long buds of exquisite form came in 1971, and the lovely dark red 'Mechak', a seedling of 'Samurai' in 1977. Other H.T. raised during the seventies include the pink blend 'Hasina' ('Youkisan' x 'Balinese'), the red 'Lalima' ('Picture' x 'Jour d'Eté'), the orange scarlet 'Nayika' (1975), 'Raat Ki Rani' dark red, apparently a sister seedling of'Mechak'; 'Raja of Nalagarh', orange scarlet ('Samurai' x 'Montezuma'), the pink blend 'Rampa Pal', and the orange scarlet 'Ranjana' ('Sabine' x unknown), as well as the bicolour 'Surkhab'.

Among the Floribundas, apart from 'Delhi Princess', mentioned earlier, pride of place should be given to the golden orange red 'Banjaran' (1969), perhaps the most popular of Indian-raised roses and one which has performed well in trials abroad. During the seventies, some of the outstanding Floribundas raised include the orange scarlet 'Sailoz Mookerji' (1973), the pink blend 'Chitchor' (1972), the light yellow with pink 'Madhura' ('Kiss of Fire' x 'Goudvlinder'), and the orange vermilion 'Suryakiran' ('Orangeade' seedling).

During the eighties there was in a way, a slight shift of emphasis from pastel pinks to seedlings in shades of salmon, lilac, apricot orange, and dark red. Among the varieties used by Dr Pal in this latest phase of his work have been the reputed florist's rose, 'Sonia', the lilac Hybrid Tea 'Lady X', the bicolour Hybrid Tea, 'Granada', the apricot 'Chantré', as well as his favourite seed parents of earlier years, 'Sabine', 'Kiss of Fire', and 'Samurai'.

Among the 'Sonia' seedlings is 'Divaswapna' (1981), a shimmering blend of silvery pink and white which has inherited the beautiful reflexing form of the seed parent; and the elegant salmon 'Apsara', which may prove suitable for cut flowers as the plants are vigorous and floriferous; and the porcelain pink 'Aravalli Princess' (1983), with high-centred blooms that unfurl slowly.

'Granada' has been used to produce the Hybrid Tea, 'Indian Princess' (1980) ('Super Star' x 'Granada') with a very interesting colour ranging from light red on the outer petals to carmine with silvery edge on the inside; as well as the lovely lilac pink 'Akash Sundari' ('Granada' x 'Lady X').

Using 'Chantré', has come the glorious 'Golden Afternoon' (1980), which is rich coppery orange on the outside and golden apricot on the inside, with a delicious spicy fragrance. Probably his latest Hybrid Tea in this colour range, 'Eastern Princess' (1984), which is orange coral with a gold base, also derives its colour from 'Chantré'.

Seedlings of 'Sabine' include the geranium lake 'Nishada' (1982) ('Sabine' x 'Anvil Sparks'), bearing massive, shapely and intensely fragrant blooms, and the glowing pink Hybrid Tea 'Sandeepini'.

Using 'Samurai', Dr Pal has raised Dr R.R. Pal, a Hybrid Tea (1983) which bears huge flowers on strong upright stems ranging in colour from deep rose red to dark velvety red, 'Lai makhmal', a Hybrid Tea, again dark velvet red, but this time with a hint of ebony. The latest in this series of red roses is the blackish velvet crimson 'Dilruba', also a Hybrid Tea (1984), with high centred very fragrant blooms, and 'Ashirwad', a Hybrid Tea (1984), a bright red with golden based petals.

It is difficult to be exhaustive while dealing with the work of as prolific a rose breeder as Dr Pal with many more to come. The spectrum of roses already raised by him are his brain behind the scientist's hand but selected by the artist's eye, will act as the building block for the rose breeders of the future.

Taking up the work done at the IARI, we may note that the accent on hybridization is on evolving new cultivars for export of cut-blooms; disease-resistant garden roses, and cultivars with high essential oil content.

The earliest rose breeders at the IARI were V. Swamp, R.S. Malik, and A.P. Singh. Thereafter, Dr B. Chaudhury headed the Division of Floriculture followed by Dr U.S. Kaicker. Work at the Institute started in 1956, and among the earliest varieties evolved were 'Pusa Sonia', a golden yellow Hybrid Tea, seedling of 'McGredy's Yellow'; 'Himangini', an ivory white Floribunda, seedling of 'Saratoga', and 'Suryodaya', an orange Floribunda seedling of 'Orangeade', in 1968. Thereafter, considerable progress has been made towards attaining the objectives of the Institute's rose-breeding programme.

In its rose-breeding programme the IARI has laid great emphasis on Dr Pal's Floribundas and Hybrid Teas, 'Delhi Princess' which appears in the parentages of no less than five Hybrid Teas raised, 'Bhim' 1970 ('Charles Mallerin' x 'Delhi Princess'), with very full scarlet red blooms and is considered to be one of the best red roses to be evolved in India; 'Charugandha' 1972 ('Delhi Princess' x 'Eiffel Tower'), another crimson red Hybrid Tea; 'Raj Kumari' 1975 ('Charles Mallerin' x 'Delhi Princess'), Hybrid Tea in fuschia pink, 'Surabhi' 1975 ('Oklahoma' x 'Delhi Princess'), in shades of phlox pink. Two of the latest Hybrid Teas arising from the use of'Delhi Princess' are the 'Vasanth' 1980 ('Sweet Afton' x 'Delhi Princess'), which bears Chinese yellow flowers edged with Neyron rose on a profuse blooming and vigorous bush, and 'Jawahar' 1980 ('Sweet Afton' x 'Delhi Princess'), one of the best white roses raised in India so far and quite appropriately named after India's first Prime Minister.

One of the most popular roses raised by the IARI is the phlox pink Mrinalini' 1972 ('Pink Parfait' x 'Christian Dior') with exceedingly well shaped blooms of exhibition form. Indeed this may be the best exhibition Hybrid Tea. In this colour created in India to date, another variety to be frequently used in the breeding programme is 'Sweet Afton'. Apart from 'Jawahar' and 'Vasanth', already mentioned, 'Sweet Afton' has been used in raising 'Anurag' 1980 ('Sweet Afton' x 'Gulzar'), fragrant variety in shades of pink. The porcelain rose 'Arjun', also a Hybrid Tea 1980 ('Blithe Spirit' x 'Montezuma') which bears beautifully shaped blooms on a very vigorous bush characterized by the ability to throw very strong (up to 1 m length) flowering shoots may prove suitable for cut-flowers. Mention should also be made of the Solferino purple 'Dr B.P. Pal' 1980, which bears extremely shapely blooms on a vigorous bush.

Several Floribunda roses have also been raised in the IARI. Here, 'Sea Pearl' and 'Orangeade' have been the favourite parents. A very interesting Floribunda is 'Mohini', 1970 ('Sea Pearl' x 'Shola'), in unique shades of chocolate, brown and orange. Other 'Sea Pearl' seedlings include 'Prema', 1970 ('Sea Pearl' x 'Shola') in soft pink; 'Dipshika' 1975, also with the same parentage, in Dutch vermilion; and 'Sindoor' 1980 ('Sea Pearl' x 'Suryodaya') in geranium lake. Perhaps the most popular of the IARI Floribundas is the purplish-mauve 'Nilambari', 1975 ('Blue Moon' x 'Africa Star'), a mass blooming of this variety in the Delhi winter is indeed the most attractive sight.

Apart from conventional rose breeding, the IARI has conducted detailed research on evolving new rose varieties by inducing mutations using gamma-ray treatment and chemical mutagen, EMS (Ethyl methane sulfonate). 'Abhisarika', 1975, an induced mutant of 'Kiss of Fire' using gamma irradiation is one of the five outstanding results. This rose has exquisitely shaped blooms of yellow with gaily-striped red, and is deservedly the most popular.

Shri G. Kasturirangan of K.S.G. Sons, Bangalore, as the owner of one of India's larger rose nurseries, has been chiefly responsible for ensuring that the tradition of rose breeding at the commercial rose nursery level, initiated by the Bhatcharjis, was continued. Apart from having access to a very large number of rose cultivars, Shri Kasturirangan had the most invaluable advantage as his father, the late Shri K.S. Gopalaswamiengar, India's one of the most outstanding breeders of ornamental plants. His bougainvilleas and crotons are still widely grown all over the country. A feature of the hybridization work done by Shri Kasturirangan is that he has contributed to all the rose types—Hybrid Teas, Floribundas, Polyanthas and Miniatures, by a prolific output of varieties numbering almost a hundred at present.

The better performing includes the bicolour, 'Srinivasa' 1969 ('Columbus Queen' x 'Charlotte Armstrong' x unknown), bearing very full high-centred blooms of red with white reverse. To this day it remains one of the best Indian-raised roses and is a regular prize winner at the rose shows. Following the same tradition is 'City of Panjim' 1972, Hybrid Tea ('Altesse' x 'Traviata'); one of his newer Hybrid Tea is 'Agnihotri' 1981, named in memory of a reputed Indian horticulturist, which bears massive blooms of rose red with lighter overtones.

Coming to the cluster-flowered class, Floribundas, we should note 'Devadasi', 1967 ('Lilli Marlene' x unknown), with dark-red-scented flowers, and the two uniquely-coloured Polyanthas, 'Bharani' and 'Nartaki'. 'Bharani' bears very deep magenta-purple with white eye flowers, and 'Nartaki', with dark lavender blooms and its yellow stamens adding to the beauty. In fact, 'Bharani' has recently been introduced in the U.K. under the name 'Baharmi' by Gandy's Roses.

Slightly later in the 1960s three more rose hybridizers made their appearance on the Indian scene. They are the late Raja Surender Singh of Nalagarh, Dr M.N. Hardikar, and myself.

Raja Surender Singh, in a short period between 1968 and 1971, hybridized no less than 13 varieties, employing seed parents such as 'Peace', and 'Clovelly'~his charming satin-pink 'Nazr-e-Nazar' a Hybrid Tea 1968 ('Clovelly' seedling) is perhaps the most prominent of these introductions, although the lilac Hybrid Tea, 'Yamini Krishnamurthy' 1969, also attracted considerable interest during its time.

Dr M.N. Hardikar, who started his work in 1967, is perhaps the pioneer of rose breeding in Western India. He describes how he was initiated into this activity by that great rosarian of Poona, R.S. Deshpande. Curiously, there is no information on whether Deshpande himself raised any new roses. Dr Hardikar's main objectives in rose breeding are to raise a really good crimson rose and a blend, both in the Hybrid Tea class. To this end he has raised several hundreds of seedlings out of which seven, up to 1980, were considered worthy of release. He has employed the varieties 'Scarlet Knight' ('Samurai'), 'Kronenbourg' and 'Festival Beauty' extensively in his work. Among this roses which deserve mention are 'First Rose Convention' a Hybrid Tea, 1971 ('Kronenbourg' x 'Helen Traubel') is dark red; 'Cynosure', also a Hybrid Tea, 1971 ('Scarlet Knight' x 'Festival Beauty') which is a striped rose with purple-pink stripes on red petals and very vigorous; and the fragrant pink 'Swami', a Hybrid Tea, 1971 also with the same parentage. More recently, Dr Hardikar has released 'Flying Tata', a Hybrid Tea, of bright crimson red with velvety sheen representing a further stage in his search for the ideal red rose. A new bicolour, pink blend, Hybrid Tea, is proposed to be named by him in honour of Dr B.P. Pal.

My rose breeding work started in 1966. Probably because I was somewhat younger than the other hybridizers, whose work has been described so far. At the time of starting work, my objectives were comparatively more ambitious—with an emphasis on evolving a new line of heat-resistant roses with good vigour and long-lasting petal texture to cope with the scorching Indian sun. To this end four of the older types were selected. These were, the Tea roses; the Polyantha, 'Cecile Brunner'; the fragrant Bourbon hybrid, 'Rose Edward'; and the vigorous fragrant bush rose, 'Gruss an Teplitz'. These were used generally as seed parents and intercrossed with standard varieties, both Hybrid Teas and Floribundas, with the objective of combining the better qualities of each parent.

Using a pink Tea rose, probably 'Catherine Mermet', as the seed parent, I was able to raise a vigorous and healthy dwarf red Floribunda called 'First Offering' (in 1966-67 but introduced in 1973); which not only fared well in Hyderabad but performed outstandingly in the much more difficult climate of the Madras City. The projected line with 'Cecile Brunner' led nowhere in spite of more hundreds of crosses, though there are yet a few seedlings with other polyanthas showing promise.

Work with 'Rose Edward' proved to be even more difficult than with 'Cécile Brunner'. Almost all the seedlings retained the bright pink colour, but without' any fragrance. Also, the proneness to mildew of 'Rose Edward', was even more obvious in its progeny. Of a very large number of seedlings, only a cross into the yellow climber 'Golden Showers' produced anything worth notice. This was a giant climber with very full blooms of flesh pink and a tint of apricot blessed with a strong fragrance, but, unfortunately almost sterile. On one of the few occasions this seedling produced fertile pollen, it was crossed with a lilac Hybrid Tea, 'Sterling Silver', from •which have appeared several seedlings in lovely shades of lilac purple. Work on this line is still in progress.

Work with 'Gruss an Teplitz' proved much easier probably because it is the only tetraploid rose of the four groups selected. An early success was the bright orange-red Floribunda 'Mahadev' 1975, which to this day is one of the brightest in this colour range. Another seedling with 'Gruss an Teplitz' intercrossed with the lilac roses 'Lake Como', 'Angel Face', and 'Lady X', led to the orchid-lavender 'Vanamali' 1978, which has been well received in various parts of India. Further work is now in progress with 'Vanamali' inter-crossed with some of the purple lilac seedlings raised from the 'Rose Edward' line described earlier. The 'Gruss an Teplitz' line also resulted in the pink-amber 'Amrapali', Floribunda 1979, and, the velvety magenta purple Hybrid Tea, 'Kanchi' 1970. 'Kanchi' has been doing well in a variety of climates.

Meanwhile, as soon as McGredy's first hand-painted-floribunda, 'Picasso' appeared in 1971, another objective was added to the list—to raise a good Hybrid Tea in the hand-painted range. After considerable effort came 'Priyatama', 1975, raised from a cross between the familiar Hybrid Tea, 'Inge Horstman' and 'Picasso'. In this, perhaps the first Hybrid Tea in the hand-painted strain, every flower is a different combination of white, pink and red. Introduction of this variety had to wait till 1981, since it was being tested in the US, where though the flower was almost always 'outstanding', the plant growth did not prove reliable in the heat of the American summers. A further cross with 'Priyatama' and the white Hybrid Tea 'Honor', has produced a very vigorous and shapely white-edged pink which is scheduled for release this year. Two of my other roses worth mention are the lilac pink 'Rajni', a Hybrid Tea, 1983, raised from a cross between 'Violaine' and 'Margaret Merrill', and the Floribunda 'Bhagmati', 1977. ('Charleston' x 'Roman Holiday') x ('Flamenco' x 'Gold Gleam') in shades of anturium scarlet with white reverse and golden eye. The latter combines unusual heat resistance and good petal texture in spite of not being raised from any of the four rose groups with which the search for heat-resistant roses began.

At the beginning of the seventies two more hybridizers, viz. Braham Datt of Nagpur, and Dr Y.K. Hande of Poona, started their work. Starting in 1970-71, Shri Braham Datt has been making several hundred cross-pollinations every year, with a variety of seed and pollen parents. After rigorous selection his first 'K.K. Thakur', a Hybrid Tea ('Daily Sketch' x 'Grand mère Jenny'), in shades of deep apricot was released only in 1980. Other more recent roses from this hybridizer are 'Don Nielsen', a Hybrid Tea, 1983 ('Inge Horstman' x 'Gold Topas'), a lovely pink and cream bicolour, and 'Pride of Nagpur', a Hybrid Tea, 1983 ('Grand Slam' x 'Tatjana') which bears very large dusky red flowers with good fragrance. Another of his outstanding unreleased variety is appropriately called 'Indian Festival', a Hybrid Tea ('Beauty of Festival' x 'Timothy Eaton' x 'Miss Ireland').

Almost simultaneously with Braham Datt, Dr Y.K. Hande, clearly brings his knowledge of agricultural science to bear on his hybridization. He has been concentrating on Hybrid Tea roses suitable for the climate of western Maharashtra, and his work is marked with great attention to detail an objective selection. Seed parents employed by him include 'Christian Dior', 'Swarthmore', 'Norita', 'Lady X' and 'Colorama'. Among the outstanding roses raised by him are the lustrous pearly-pink exhibition Hybrid Tea rose, 'Indian Pearl', 1983 ('Christian Dior' x 'Pascali'); the very fragrant, light-red Hybrid Tea 'Perfumer', 1983 ('Swarthmore' x 'Blue Moon'), wich may fulfil the need for a fragrant cut-flower rose for western Inc and, the highly decorative bicolour Hybrid Tea ('Ajanta Caves', 1983 ('Coloramma' x 'Norita'), which bears eye-catching flowers of apricot-ivory-blended scarlet-red on the petal edges.

Among commercial rose growers, Mrs P.L. Airun of Anand Roses, Jaipur, J.P. Agarwal, the doyen of Indian rose nurserymen, Friends Rosery, Lucknow, and Arpi Thakur of Doon Valley Roses, Dehradun, have each made a contribution.

Mrs Airun's very first introduction 'Golden Days', 1976, Floribunda/Hybrid Tea type ('Whisky Mac' x 'Duet') which bears perfectly-shaped blooms of golden yellow edged red, has proved very popular. One of her more recent introductions is the Floribunda, 'Mahak', 1982 in shades of peach pink and apricot, with the added bonus of fragrance.

The Hybrid Tea, 'Kasturi Rangan' bears blooms with exciting shades of mauve with yellow base. To release a new rose at the age of 80 plus is a singular achievement indeed.

Arpi Thakur's 'Ajanta', a Hybrid Tea, 1978 ('Lady X' seedling x 'Memoriam'), in shades of mauve with a hint of green, has also attracted favourable notice.

The painstaking work on rose growing in the TISCO Nursery, Jamshedpur, by R.R. Karnad *et al.* also deserves mention. Among the several roses from this source are 'Pioneering Pilot', a Hybrid Tea, 1982, named to commemorate the historic flight by Sir J.R.D. Tata, which bears lovely flowers in deep purple red.

The pioneering work being done at the National Botanical Research Institute, Lucknow, by Dr M.N. Gupta *et al.* on colchicine-induced mutation should lead to some exciting introductions in the future.

Several other hybridizers, full details of whose work are not readily available, have also introduced one or more varieties each.

It will also be appropriate to emphasize that a great deal of important work has already been done by the Indian hybridizers with rudimentary facilities for research and without any incentives, financial or otherwise.

FUTURE OF INDIAN ROSES

Taking up the question of the future of Indian roses it should be npted that the popularity of rose growing in India on a long-term basis is directly linked to the production of suitable varieties for each of India's rose-growing zones. In a thought-provoking article the US hybridizer Dr John James has remarked:

1. There is no universal modern rose, no matter how high the rating—one that will perform well everywhere.
2. This points to a fact that we ignore or choose not to recognize—roses are local or regional.

Arguing further, he points out that what are required are roses which grow well for home owners who are not avid gardeners. To drive home the point, he reports on the results of a survey in which he questioned a number of young people just starting out with their homes and gardens. On being asked whether they were going to plant roses, and if not, why not, the usual answers were: "Too much trouble", "Too expensive", "Don't live long", and "Don't always flower as expected".

This same point has been made much earlier by the doyen of Indian hybridizers, Bhatcharji, when he states that "rose growing is for the pleasure of having enough of good flowers on healthy plants under normal care"

The future of rose growing in India will be assured only when roses are grown not chiefly by enthusiasts as at present, but generally by all those interested in gardening If this is to happen, roses raised in India should be given a fair trial by rose growers who seem to be generally under the impression that what is raised in India cannot possibly be as good as what is imported from Europe or the US. Happily, this potentially disastrous misconception does not extend to our farmers who will hardly plant a wheat variety evolved in the US in preference to one raised in India, and recommended for being grown in that agroclimatic zone.

Apart from this mental block as regards Indian roses referred to above, two main factors stand in the way of Indian roses becoming more popular: (i) the absence of plant patent laws, which inhibit large-scale rose hybridization, there being no financial reward; (ii) the absence of trial grounds where Indian-raised varieties could be tested and their suitability determined for the various rose-growing areas in the country.

Taking up the latter point first, we may refer to the exhaustive "Rose-Calendar" prepared by Sunil Jolly, nurseryman from Dehradun, who has divided the country into 8 rose-growing zones. Ideally, we should have one trial ground at least in each of these zones, which, as Dr Pal suggests, could be one of the agricultural universities situated in the zone.

As regards plant patent legislation, it is curious that the Governmet of India should adopt an inhibited attitude to such an important piece of legislation, which will provide a tremendous incentive not only **for** the rose hybridizers, but for hybridizers of other horticultural plants as well. N: valid objection can possibly be raised to plant patent legislation which covers vegetatively-propagated plants such as roses.

On the part of the Indian rose hybridizers what is required is "a bold response to the challenge of breeding better roses for India. To reiterate what we really need is a separate line of breeding for the warm tro climate, and mere crosses between standard varieties evolved in the West, which have been selected for good performance in cold climates will not lead us very far". Indian rose hybridizers will have to ask themselves the question, why they still continue to raise new cultivars mainly by inter-crosses of imported rose varieties. Surely at least one of the parents in each cross could be the hybridizer's own introduction, selected for good performance in the Indian climate. Even the IARI seems to suffer from a needless inferiority complex about its own varieties—as these hardly ever figure as one of the parents in later introductions. Unless this trend is reversed the prospects of evolving a separate line of warm climate roses are indeed dim.

Before concluding, reference should be made to what is probably the most exciting prospect for rose breeding in India—that is, breeding with *Rosa clinophylla (R. involucrata).* As already stated this species is obviously well adapted to the warmth of the plains and also to water-logged conditions. Like many of the wild roses it is diploid—it is closely related to the black-spot-immune *R. bracteata,* and hopefully may carry the genes for black-spot resistance also. Since modern roses are tetraploid the difference in chromosome numbers will no doubt pose some initial problems but these could be overcome by standard procedures.

If rose hybridizers could raise hybrids with this rose species, a giant step forward would have been taken in evolving authentic Indian roses easily grown, not only in our own country, but throughout the tropical regions of the world, which have been denied the pleasure of good and easily grown roses so far. An adequate response to this challenge will ensure the future of Indian roses.

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SUSTAINABLE ROSE GROWING & THE BREEDING OF NEW ROSES - THE VIEW FROM INDIA

Article for the book ‘The Sustainable Rose Garden’ A reader in Rose Culture.
Edited by Pat Shanley, Peter Kukielski and Gene Waering, 2010

Viru Viraraghavan

Sustainable rose growing is a subject which deserves to be center stage in the warm Indian climate, and indeed, in all other warm climates of the world, where disease problems are at their worst. What do we mean by ‘sustainable rose growing’? ‘Sustainable’ in the broad sense means ‘something which can be maintained’ and for the environmentally conscious, as all of us rose growers should be, it means ‘maintenance without adverse environmental impact’. Unfortunately, standard rose growing practices in India are quite often the very reverse of sustainable, burdened as the Indian rose grower is with growing roses, raised in temperate climates, under tropical conditions. Ask a keen rose grower in India whether you can grow roses, and the response will be an enthusiastic ‘yes’, but further enquiry will reveal the amount of exertion involved – weekly combination sprays with fungicides and insecticides is the easiest part. The environmental impact of such practices is significant, and it is no surprise, considering the amount of hard work involved that rose growing is confined to the real enthusiast or keen exhibitor.

The pioneering rose hybridizer, B. S. Bhatcharji put the matter in simple words : - he was writing in the 1930’s - that rose growing is for the pleasure of raising beautiful flowers under normal care. As a hands-on horticulturist what he meant by ‘normal care’ was that there was no need to display the over-enthusiasm of the rose exhibitor, but at the same time you could not expect to grow a rose without giving it the care which you would bestow on raising tomatoes or cauliflowers in your vegetable patch.

If we are to have easily grown roses - such rose varieties as can be grown under normal care, the basic requirement is growing roses which have reasonable resistance to fungus problems. Here again a note of caution is very much required. Rose breeders should not fall into the trap of striving for roses with that mirage ‘immunity’, but look to develop such plants which have the capacity to recover from infection without the use of fungicides. Rose varieties touted as immune to fungus problems have an alarming habit of suddenly becoming vulnerable as the fungus evolves faster than the rose’s capacity to defend itself. A case in point is ‘Baby Love’, which was completely resistant to Black Spot in my tropical mountain climate – with almost constant moist cool weather - no summer, no winter. A laboratory for breeding Black Spot!! Sure enough, after the fourth year, ‘Baby Love’ succumbed completely to Black Spot, and now performs much worse than less acclaimed varieties.

The capacity to recover from infection is a feature of many of the heritage roses, which is why they have lasted so long. Many heritage rose varieties, even under adverse conditions as in the tropical parts of India can be grown without fungicide protection. A case in point is how the favorite garland rose, 'Rose Edward', which is grown over several thousands of acres in India, will contract both mildew and Black Spot but come back victorious, and flower in delightful profusion every time.

We now come to another basic question. Is disease resistance linked to adaptation to specific climates? Can there be an universal great rose, or do we have to satisfy ourselves with roses adapted to climatic regions? Sadly, regional adaptation seems to be the rule. Even the great rose ‘Peace’ is quite unhappy in the Indo-Gangetic plain of northern India, where otherwise spectacular roses can be, and are, grown. But some of the shrub roses have wider adaptation, e.g., 'Prosperity', 'Carefree Beauty', 'Belinda’s Dream'.

The performance of the tropical *R. clinophylla* and the sub-tropical *R. gigantea*, the two species with which I am working, illustrates the point. *R. clinophylla* was planted in the sandy and saline soil of Madras (now called Chennai) on the south-eastern coast of India, in a garden quite near the sea, where the water had also become quite salty, owing to excessive pumping. Amazingly, the rose was quite happy despite very little attention, no sprays, no manures, and only the occasional watering by a rather erratic gardener. The Madras climate, warm and humid almost throughout the year is one of the worst rose growing climates in India, but this rose has fresh green foliage and makes a nice bush.

When *R. clinophylla* was grown in the hot dry climate of Hosur, near Bangalore, in peninsular India, it again adapted itself remarkably well. One plant is 15 feet high and 10 feet across, in spite of the competition from the greedy roots of the nearby hedge.

But *R. clinophylla* in the cool moist mountain climate of my Kodaikanal home in southern India, under my personal care, is clearly not very happy. Mind you, this is a climate in which the average rose thrives.

On the other hand *R. gigantea* is a spectacular success in Kodaikanal. Some of my plants have climbed about 40 feet into the cypress trees, flower profusely, and never, but never, get mildew or Black Spot. Naturally, no spraying is feasible on a 40 foot high plant.

If the rose is a plant essentially adapted to climatic regions, we have to clearly hybridize roses for each region to get the optimum results. For the warm climate rose grower there is no doubt that a separate line of breeding, separate from the breeding lines in temperate regions, is clearly essential.

What should be the basis for such focused breeding? Obviously, we have to start with heritage roses well adapted to such climates. Of these, the Chinas like ‘Louis Philippe’, ‘Craimoisi Superier’, ‘Archduke Charles’, and ‘Old Blush’, Tea roses like ‘Duchess de Brabant’, ‘Mrs. B. R. Cant’, ‘Rosette Delizy’, ‘Madame Falcot’ and ‘Mrs. Dudley Cross’ and some of the Bourbons – 'Rose Edward', ‘Maggie’ (‘Eugene E. Marlitt?’) ‘Souvenier de la Malmaison’, stand out in various warm climates ranging from peninsular India, southern United States, Puerto Rico, the West Indies, Bermuda and Brazil, and parts of Australia. Many of the Noisettes and a few of the Hybrid Perpetuals, for example, ‘Frau Karl Druschki’ and ‘Paul Neyron’, are similarly well adapted., as also some miscellaneous shrub roses like ‘Prosperity’ etc. mentioned earlier.

Among the relatively modern roses, the extra vigorous ones - ‘Queen Elizabeth’ and ‘Montezuma’, for example, are able to cope better with the warmth (but the average Hybrid Tea or Floribunda is very short-lived indeed).

Such roses, as well as *R. clinophylla* and *R. gigantea* form the basis for the new breeding line which is being developed. At this comparatively early stage of breeding it is well to remember that the rose in a tropical situation has to compete with many other beautifully luscious tropical plants, which are endowed with lovely evergreen foliage. It therefore becomes imperative to create roses which have equally beautiful evergreen foliage – such roses as are beautiful even when not in bloom, if the gardener in a warm climate is ever to grow roses. As it is, very few roses are being grown in these climates.

In addition to the foliage factor and disease resistance, the forcing conditions provided by tropical heat have to be taken into account. We need roses in the Tea-clinophylla line which are bushy and evergreen, and gigantea hybrids of manageable size. Some of the new roses raised with this approach are already proving to be good performers in warm climates. We could mention Tea roses like

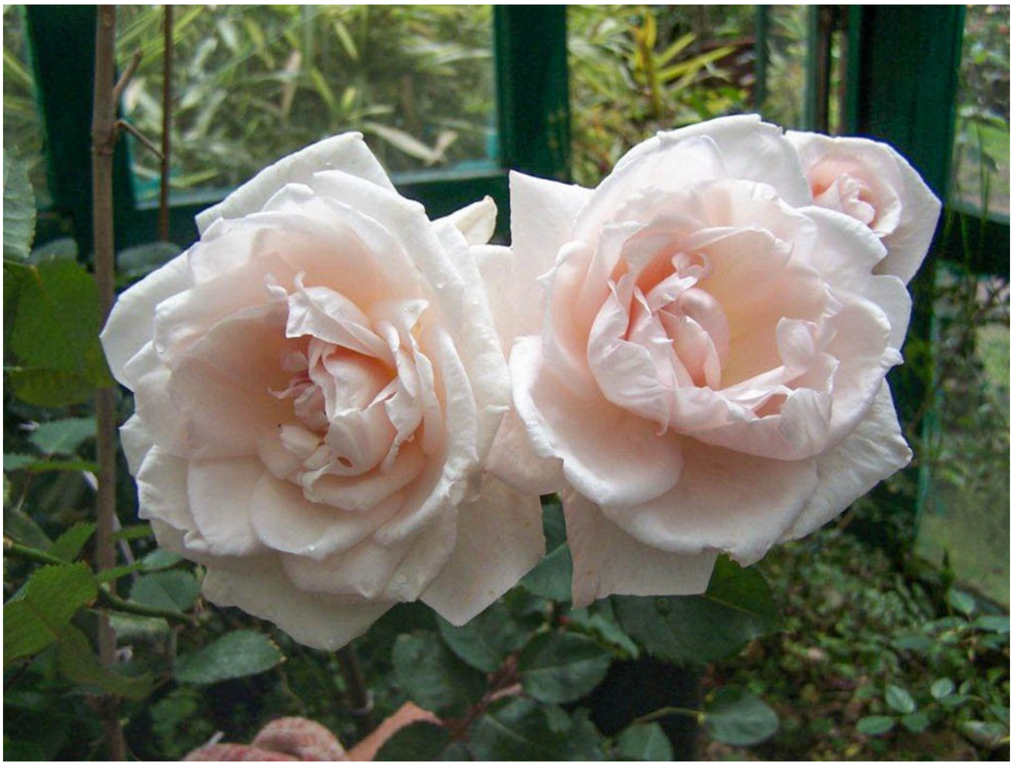
‘Faith Whittlesey’ and ‘Garnet Crest’, the hybrid clinophyllas, ‘Silver Dawn’, and ‘Ganges Mist’, the gigantea Tea, ‘Alister’s Gift’, and the hybrid giganteas like ‘Naga Belle’, ‘Evergreen Gene’, ‘Amber Cloud’ and ‘Golden Threshold’ (the latter three being climbers), as being well adapted. I confess that ‘Amber Cloud’ and ‘Golden Threshold’ could hardly be described as growing to a manageable size, but other good qualities justify inclusion. They are glorious in large gardens.

Further developments in the line include bringing in the foliage of *R. laevigata*, so well adapted to warmth and endowed with perhaps the most beautiful of rose foliage. The use of *R. roxburghii* also suggests itself, as such hybrids could well grow to the dimensions of small trees, and be the substitute for flowering cherries in the tropics.

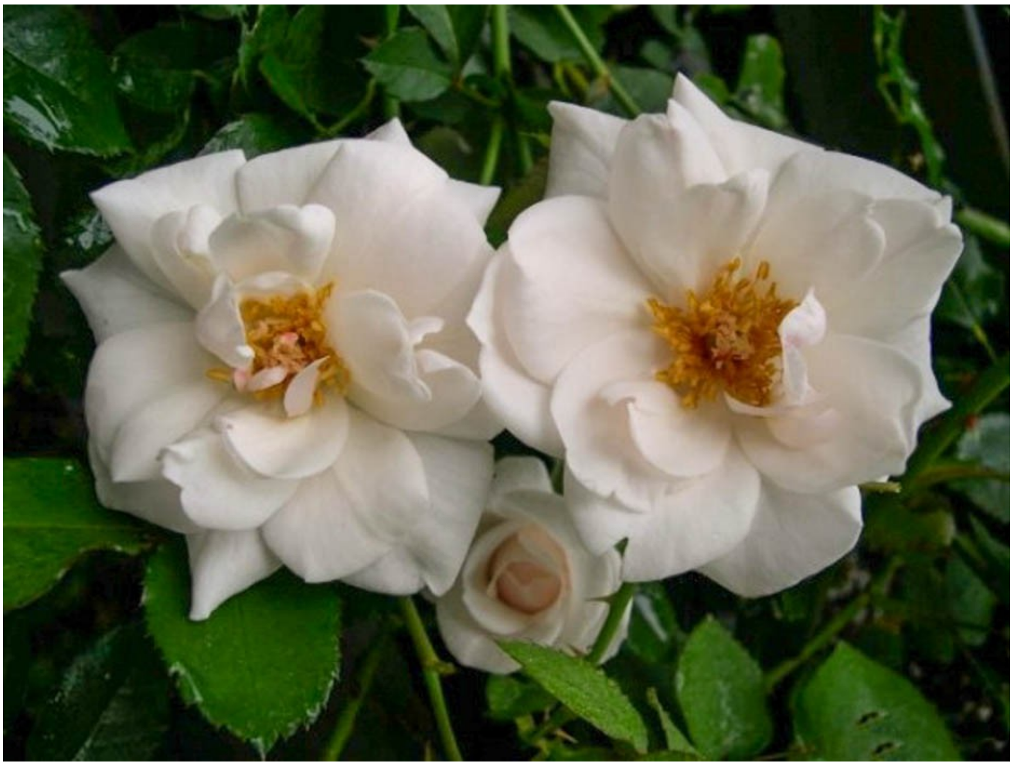
The warm climates of the world, including many rapidly developing countries have so far been denied new roses which can be grown sustainably. And we rose breeders have to strive hard to change this situation so glaringly contradicting the claim that the rose is the world’s favorite flower.

Enclosures: Pictures taken from ‘Rose’ ‘Released roses’ in Folder D

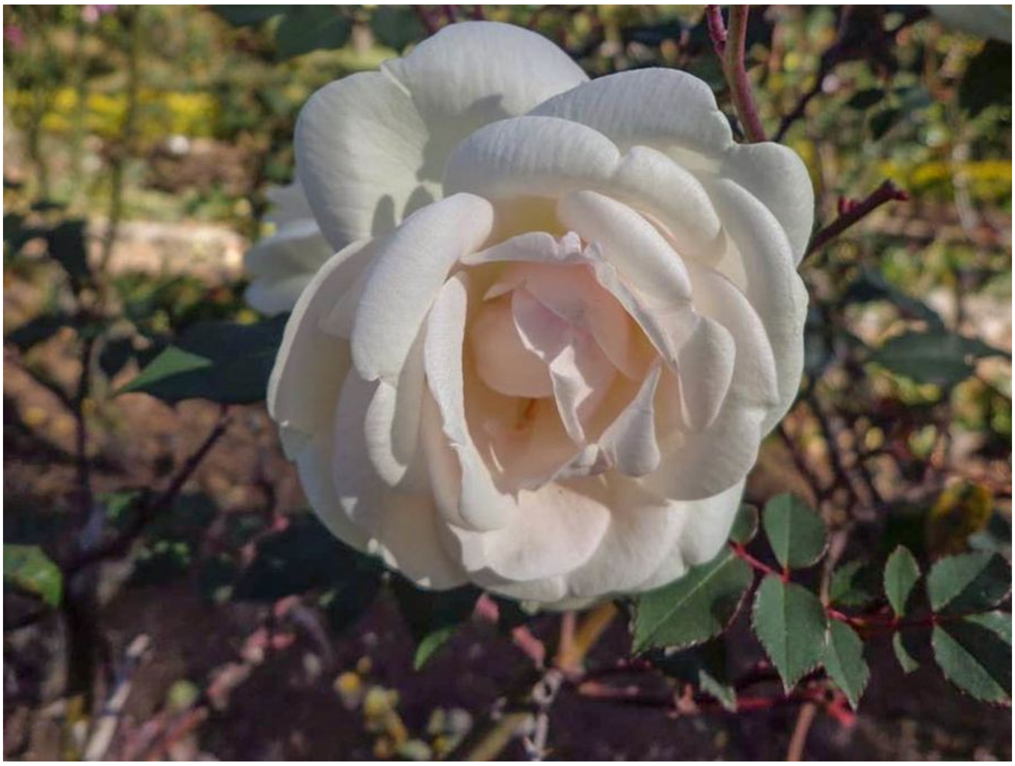
1. Ganges Mist – (single flower)
2. Silver Dawn – (No.21)
3. Faith Whittlesey – (100-0037)
4. Evergreen Gene – (cluster)
5. Naga Belle – (bunch 1)
6. Golden Threshold –(12.1.08)
7. Amber Cloud – (Clr. Hyb. Gig)
8. Alister’s Gift -- (12.2.07)



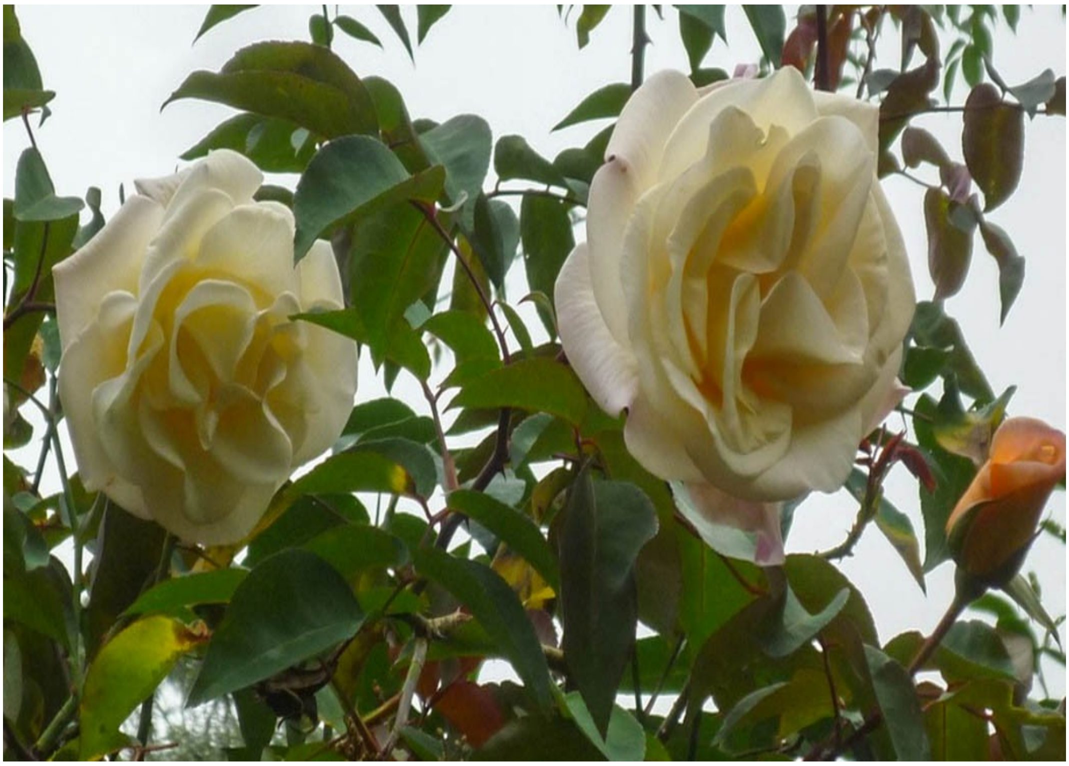
Ganges Mist



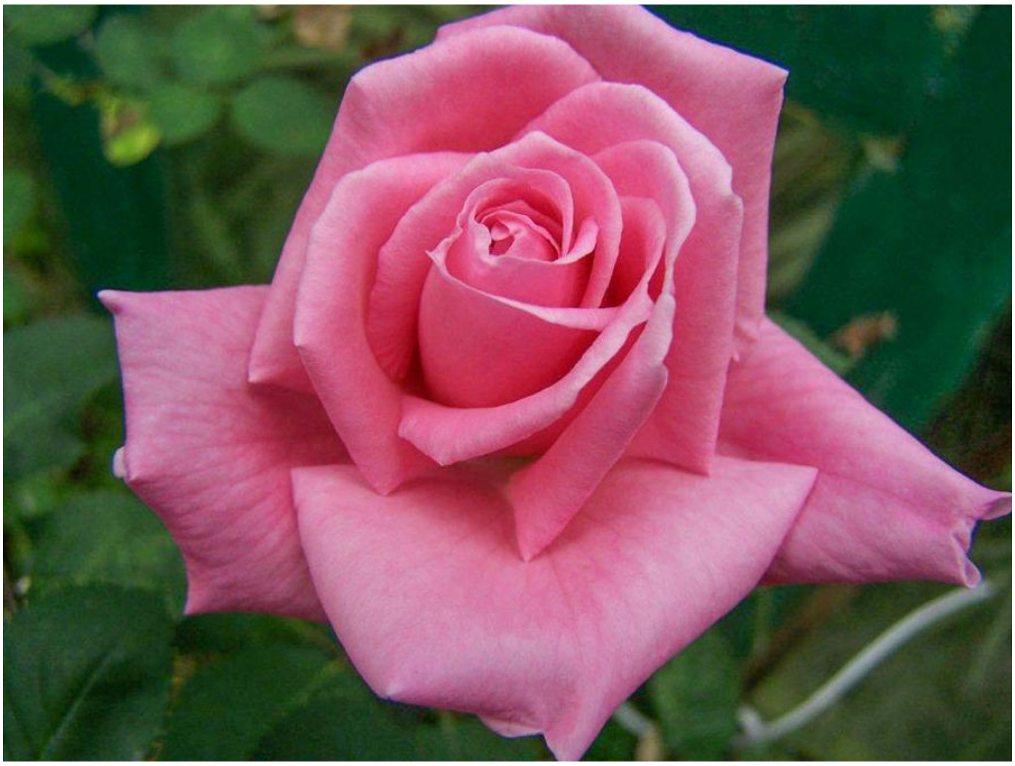
Silver Dawn



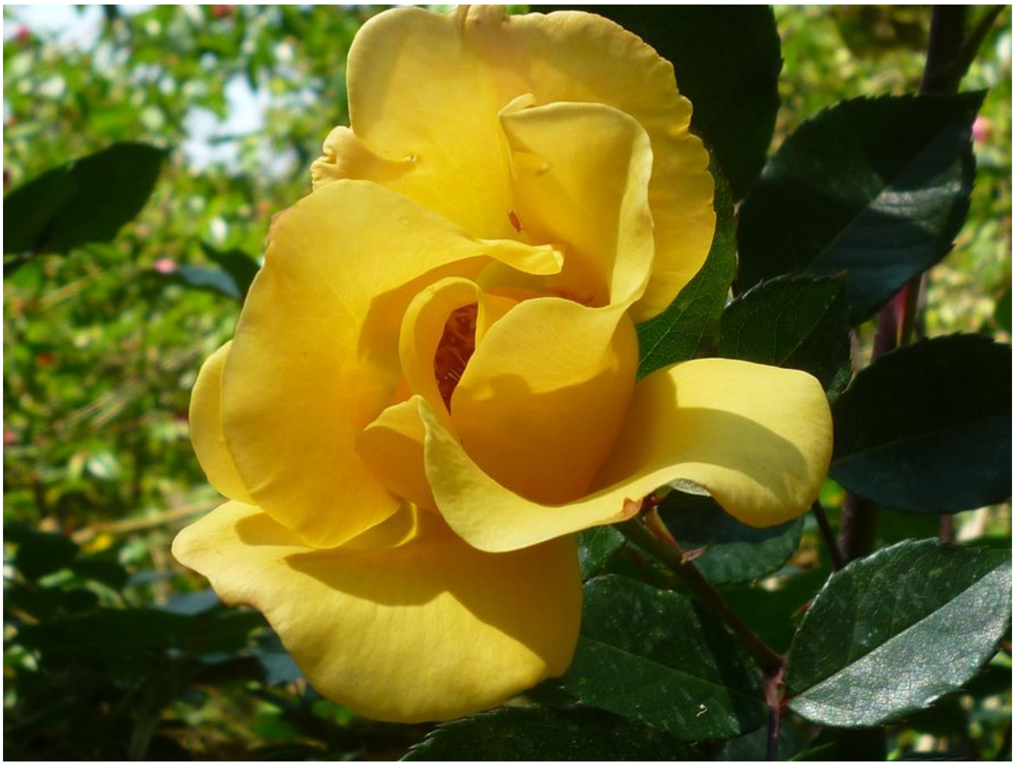
Faith Whittlesey



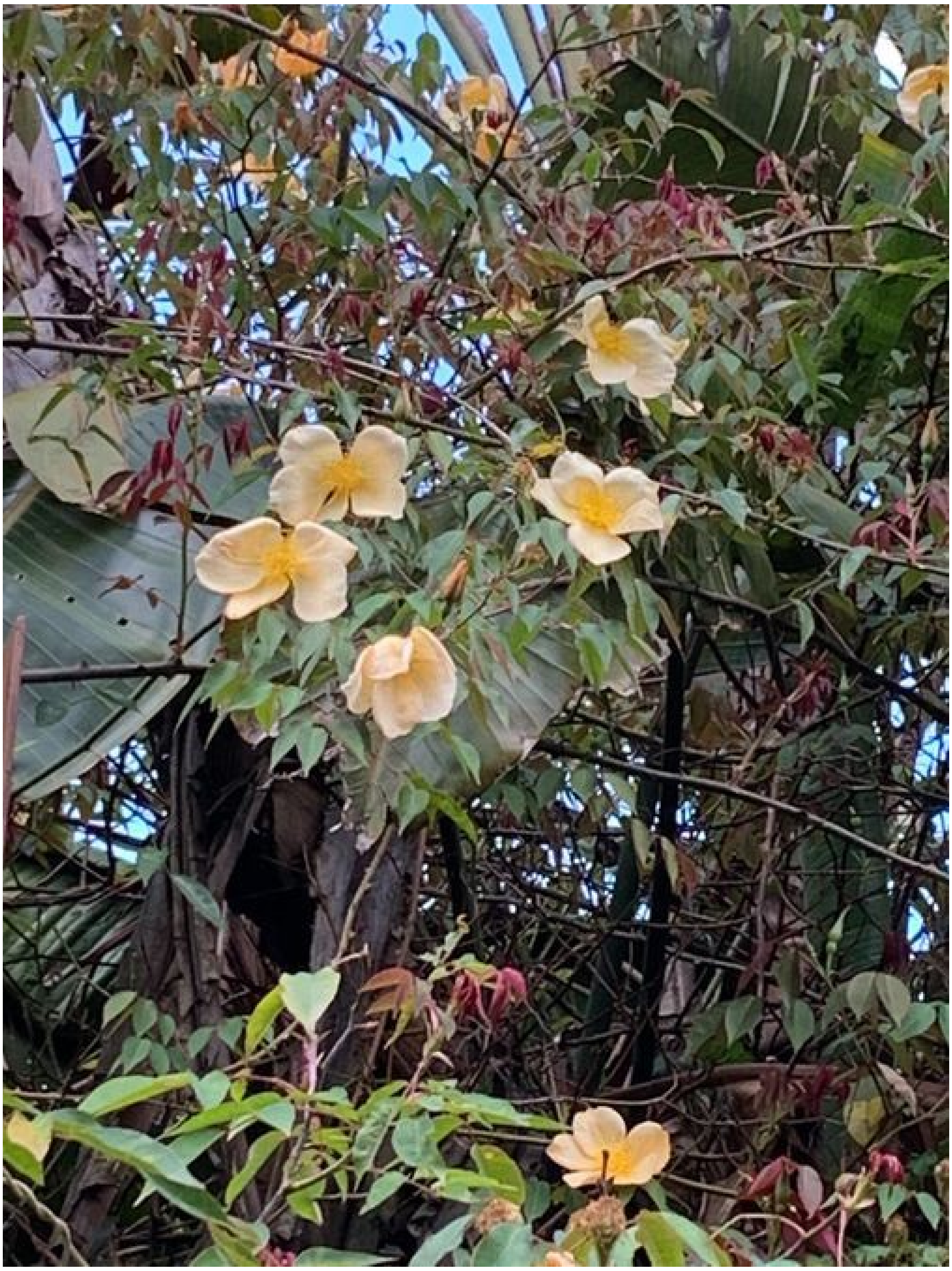
Evergreen Gene



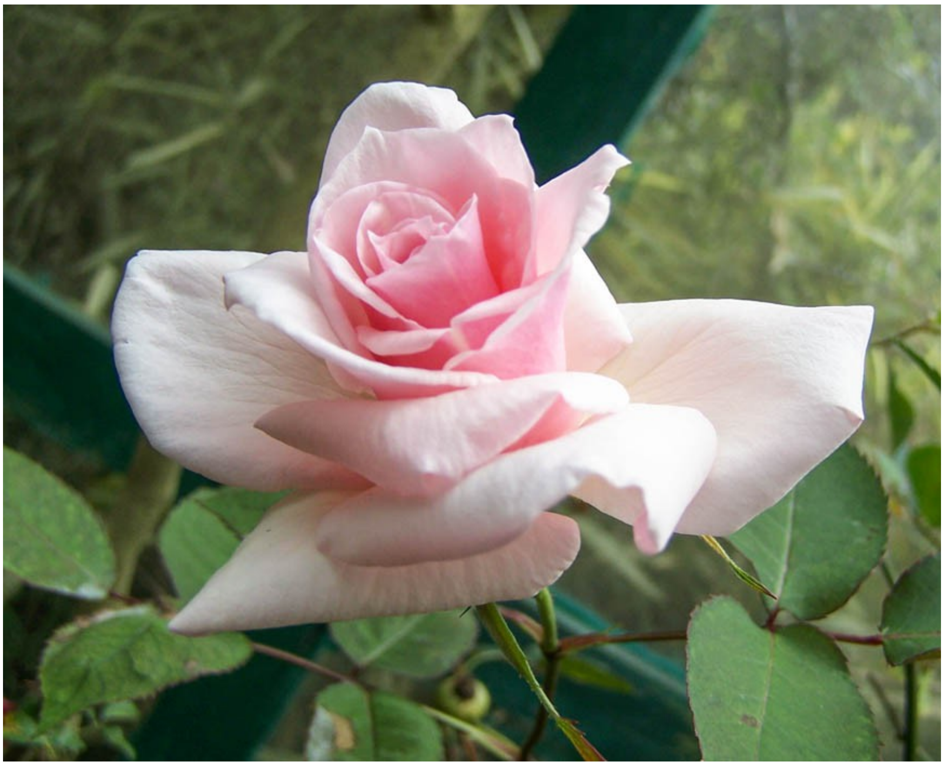
Naga Belle



Golden Threshold



Amber Cloud



Alister's Gift

Roses in India - Memories, Musings (and Mirages?)

Article for magazine HORTUS, No.26 Summer 1993

M. S. VIRARAGHAVAN

One of the most amazing features of India - a country which never ceases to surprise native and outsider alike - is the perfection to which roses from so many different lands can be grown. If one has experienced the incredible summer temperatures of the North Indian plains (120 °F/45 °C) when hot winds blow from the Thar Desert, or the aridity of the Deccan plateau landscape, where mammoth rocks, lying scattered as if by a giant's hand, radiate an intense heat, it is difficult to believe that these same lands grow the most beautiful roses during winter and the rains.

Certain memories of roses remain fresh in the mind - even after decades. One such is the vision of that glorious successor to 'Peace', 'Grandmere Jenny', in the gardens of the Taj Mahal, rivaling, in the evening light, the marble splendour of that magnificent monument. Another is the pristine silver blue of 'Sterling Silver', in a garden in Hyderabad, looking for all the world like a bit of the blue Deccan sky, glowing before the proud eyes of the grower - a rugged, earthy freedom fighter, who grew his roses with the same fervour he had brought to the independence struggle.

An eminent rosarian has divided the country into eight agro-climatic zones, where cultural operations are done at different times of the year - but this very diversity makes it possible to have good roses in virtually every month in one or other area. Roses are at their best in the North Indian plains in December and February, in the Deccan (Central India) in August and January, in the coastal areas in December and March, in the hill stations and the Kashmir valley in May and June, and, in places like Bangalore, almost year-round.

But amidst all this variety there is unity. The first Bourbon hybrid, 'Rose Edward', with its delicious fragrance, grows with equal abandon in the tropical delta of the river Cauvery, in the extreme south of India, as in Srinagar, capital of the ancient Himalayan kingdom of Tehri Garhwal. Again, India's Musk Roses are neatly distributed, with one representative - *R. lescbenaultiana* - in the south Indian mountains, and one - *R. brunonii* - in the central Himalaya, and one more member of the synstylae, *R. longicuspis,* in the north-east, adjoining the Burmese border.

Some time ago, writing on India's wild roses, I called them the 'aristocrats of the Rose world', and if you see their splendour in the wild, such praise is amply justified. India's wild roses are most abundant in the mountain areas, with several representatives in the vast Himalayan range stretching from Kashmir to Assam (a distance of nearly 1500 miles), one in the south Indian mountains, and one more - perhaps the most extraordinary of all, *R. clinophylla* - spread throughout in the tropical and sub-tropical regions of the country.

In the Himalaya, the climate varies appreciably from west to east. Starting from the west, in Kashmir we find two typical Iranian species, *R. foetida* and *R. ecae,* both bright yellow. One other interesting Central Asian migrant is *R. beggeriana,* with the highest known concentration of vitamin C in its heps. But the typical rose of the Western Himalaya is *R. webbiana,* which inhabits the most inhospitable tracts yet manages to produce a wealth of the most beautiful lilac-pink flowers - Jack Harkness's 'Faerie Queen of wild roses'.

Moving further east, in the Central Himalaya, we have one more member of the Cinnamomeae, *R. macropbylla.* I recall the thrill when we encountered this species on the footpath to the Valley of Flowers: turning a corner, by the side of a wooden bridge we came upon a magnificent plant in full bloom, the flowers - a lovely claret-red with contrasting golden anthers - charmingly reflected in the icy waters of the Pushp Ganga ('Flower Ganges'). Further up (beyond 10,000 feet) is that unique four-petaled rose, *R. sericea,* which occurs from the (central Himalaya right up to the Burma border. Of course, one more rose of this area is the Himalayan Musk Rose, *R. brunonii,* which adorns the lower slopes at about 7000 feet, covering trees and hanging down from them in festoons of white.

Still further east, we have the evergreen *R. longicuspis,* most abundant near Shillong in the Khasi Hills. (As I write, a plant collected last year from this area is starting to open its first blossoms, but it is the bright, shining foliage which places this rose in a class by itself.) Thereafter, on the south-eastern edge of the mountains (not quite the Himalaya, but near enough), in Manipur, we have that most remarkable rose, *R. gigantea* - Graham Stuart Thomas's 'the queen, the Empress of wild roses', capable of growing 100 feet high with flowers in more than six inches across. There is a charming description of this rose the unpublished Diaries of Sir George Watt, Surveyor-General of India at the end of the last century. Writing in 1882, he observed how the rose envelops trees on which it is found, providing a superb effect, for when seen from a distance the trees appear like magnolias with yellow flowers. The hips are large 3 inches across - and ripen to golden yellow rather than red. Interestingly, the yellow form of *R. gigantea* was first found in Manipur, whereas the Burmese version seems to be generally white.

The South Indian mountains - the Nilgiris and the Palnis - are the habitat of R. *leschenaultiana,* which bears large corymbs of scented white flowers on very distinctive plum-purple stems.

We are now left with the wild rose of tropical and sub-tropical India, *R. clinophylla (R. involucrata).* Botanists have distinguished at least three forms of this rose, and a fourth, *R. lyellii,* which according to some is a distinct species. This unique rose bears white flowers (closely resembling those of *R. bracteata:* both are members of the *Bracteatae)* which are very strongly scented with a fragrance intriguingly reminiscent of nail-polish remover or acetone. Forms of this rose can be found in the Bengal plains (on the islands of the Ganges), in similar situations in the adjoining states of Orissa and Bihar, in Manipur (around 2000 feet), in Dehra Dun (in the Himalayan foothills), in Mount Abu (in the extreme west of India, at 4000 feet), in Coorg (near Mysore, South India), and in the northern parts of the Eastern Ghats (Andhra Pradesh).

Sir George Watt remarked upon the very curious distribution of this rose: it occurs in abundance in scattered areas throughout the country, separated by hundreds of miles from each other, but does *not* occur in in-between areas with similar climates. In recent years this species has been rightly held to be the answer to the rose breeders' quest for better roses for tropical areas.

While wild roses are typically mountain plants, roses and rose cultivation seem to have been known from ancient times. Until recently it was thought that rose growing became popular in India only with the arrival of the Mughals (AD 1500), but there is a fascinating account by a Portuguese visitor to South India, again around 1500, which describes how the kings of the Vijayanagar Empire were adorned with roses on ceremonial occasions. Obviously, this can have had no connection with the Mughal rulers of North India; even more interesting is the occurrence of a verse, giving various names to the rose, which dates from the tenth century BC and includes the name 'Shivapriya' ('beloved of God Shiva'). Since Shiva is typically a god of the Himalaya, this clearly suggests that the ancients were familiar with the wild roses of the mountains.

Which roses are popular in India today? There are two distinct types being grown: those which are raised for worship in temples, and for making garlands (an indispensable part of any festivity); and those which are grown in the gardens of fanciers.

The most popular rose for traditional use is 'Rose Edward', but there is another Bourbon rose (unidentified) with light red flowers and a fruity fragrance (unlike the damask of 'Edward') which is also commonly grown. Two other well-liked varieties are the red 'Gruss an Teplitz', and the Bourbon 'Souvenir de la Malmaison' - the latter most popular in the drier parts of Western India. A bush which I saw near Ahmedabad recently, fully 8 feet wide and high and covered with flowers, presented a most impressive spectacle.

Coming to garden roses, apparently American-raised roses do better in India than those of Europe, which tend to suffer more in the heat. Many of the All America Rose Selections (AARS) do exceptionally well, particularly in the two main rose-growing areas of the North Indian plains and the Deccan plateau. Varieties like 'Montezuma' and 'Maria Callas' are very adaptable; 'Montezuma' grows exceedingly well even in the difficult climates of Madras and Lower Bengal. Three other outstanding performers in difficult climates are the China (polyantha) 'Mlle. Cécile

Brunner', the China 'Archduke Charles', and the Hybrid Musk 'Prosperity'.

As can be imagined, each major rose-growing region has its own favourites. Around Poona and the Deccan plateau there are several hundred acres under 'Toro' (indistinguishable from 'Gladiator'), which bears huge, perfectly-formed flowers of a dull, dark red. The north favours 'Papa Meilland' and 'Mr Lincoln' (red), 'Michelle Meilland' and 'First Prize' (pink), 'Helmut Schmidt' and 'King's Ransom' (yellow), 'Paradise' (lilac), 'Garden Party' (white) and 'Super Star' (vermilion). However, with the formation of several rose societies, and the establishment of the Indian Rose Federation in 1979, you can find the world's latest roses being grown by connoisseurs throughout the country.

Contributing to the greatly increased popularity of roses is the poly-bag method of propagation, invented by a well-known rosarian of Poona, N. A. Joshi. Rose plants are produced in their thousandby budding on stock cuttings rooted in poly-bags, making handling easy. The two most common rose stocks used are *R. multiflora* and R. *indica.*

Though roses flourish well enough in private gardens, it must be confessed that India is sadly lacking in good public rose gardens. The Mughals, and later the British, established many lovely gardens - the Shalimar gardens of Kashmir, the Lloyd Botanical Gardens in Darjeeling (Eastern Himalaya), Sim's Park and the Ooty Botanical Gardens (Nilgiri Hills). Many of them had lovely roses: in *Climbing Roses Old and New* Graham Thomas quotes C. M. Villiers-Stuart *(Gardens of the Great Mughals)* ~ 'But the loveliest roses in the garden [Shalimar] are the Maréchal Niels which climb the grey green walls of the Hall of Public Audience and hang their soft yellow globes head downward in clusters from the carved cedar cornice.' Today 'Maréchal Niel' and other roses of yesteryear are, I am afraid, appreciated only in a few private gardens.

Similarly, the rosery in Sim's Park contained a wonderful collection of the original Pernet hybrids, grown to a perfection that would have delighted their originator, Pernet-Ducher. One in particular, 'Julien Potin', was perhaps the most beautiful yellow rose I have seen in India - and this was forty years ago. But these collections generally suffer from neglect. Fortunately, however, there has been a revival of interest, and we have some spectacular gardens of the post-Independence vintage: the Zakir Hussain Garden (Chandigarh), the Rose Society of India's gardens (New Delhi), and the numerous lovely gardens of the lake city of Bhopal. But nothing as yet measures up to what is possible in the domain of public gardens.

While neglect of public gardens is due mainly to a lack of interest in their upkeep on the part of Government functionaries, another reason is the rather spotty landscape effect of modern roses, except when in full bloom. Poor foliage is the culprit, and the contrast is much more evident when you compare the roses with the lovely, lush foliage of tropical plants.

What can be done to produce better roses for India? Clearly, sustained popularity will be ensured when varieties are produced which can be grown easily by the average home gardener, not just by connoisseurs, as at present. Quite some while ago, the pioneer Indian rose breeder, B. S. Bhatcharji, stressed the need to evolve a separate line of heat-resistant roses, rather than merely depending on importations from the West, where the criteria for selection are radically different. Many of his roses, raised between 1935 and 1960, are still popular, such as 'Heart Throb' (red) and 'Raja Rammohan Roy' (apricot).

Rose breeding in India was given a further impetus by Dr B. P. Pal, who combined an exceptional sensitivity to the beauty of the rose with the highest professional qualifications for a plant breeder. Dr Pal bred many outstanding roses which grow well in the North Indian plains, where he did his work. Of those, my own favourite is 'Mechak' (dark red), but the most colourful of his productions is surely the Floribunda 'Banjaran', a tribute to the gay attire of the Indian gypsy. Under his guidance, substantial work was also done at the Indian Agricultural Research Institute in New Delhi. Several other breeders, amateur and professional, are now working in this field.

However, the most exciting prospect is surely breeding with *R. clinopbylla.* Apart from its tolerance of heat, this species has beautiful, shiny, evergreen foliage. Some forms literally grow with their feet in water, which prompted Peter Harkness's remark that if other roses could be hybridised with *R. clinopbylla,* we may yet have roses for the world of water gardening.

At a personal level, I have been confronting this challenge of breeding with *R. clinopbylla* for the past many years, but the vital breakthrough is not yet in sight. However, the final answer may well be breeding a rose with evergreen foliage. Writing in 1854, the English rosarian Thomas Rivers said he hoped that ultimately gardeners would not be satisfied unless all roses had evergreen foliage, brilliant fragrant flowers, and a long season of flowering. This may seem, as he said, an extravagant anticipation, but perseverance in breeding may yet achieve wonders.

The breeding of roses in the West, with its emphasis on winter hardiness, has perhaps tended to reinforce the deciduous habit. There in - so many rose species in the warmer regions of the world with attractive evergreen foliage - *clinophylla* itself, the closely-related *bracteata, sempervirens,* and *longicuspis,* to name a few - but many of these species have not as yet been worked with for breeding garden roses. To my mind, rose breeding with an emphasis on the use of evergreen species has much to offer and will, it is to be hoped, result in roses which can be grown easily in India and other tropical regions, and which look beautiful even when not in flower. Is this a mirage?

Landscaping With Roses

Written for the Hyderabad Rose Society
Souvenir 1986

M.S. Viraraghavan

Rose landscaping in India is, disconcertingly, moored to the past. In the days gone by it was no doubt feasible to have very large exclusive rose gardens, attended to by myriad gardeners. Such gracious times are long over, and we have to think anew. A garden exclusively of roses suffers from several disadvantages, the most obvious being the fact that roses bloom only at intervals, even in the best of seasons, and there are accordingly large parts of the year in which there is nothing to attract the eye. Even worse is the visual impact of roes planted geometrically, one of each variety, prominently labeled – the style favoured by public gardens. Such layouts, far from emphasizing the beauty of the rose, tend to put off the modern gardener who is interested in a garden which looks beautiful during all seasons, and not merely during intervals when the roses are in bloom.

How to achieve a rose garden which looks beautiful even when the roses are not in bloom? If we approach the subject with an open mind it is quite obvious that the answer lies in a judicious mixture of roses with other plants, which will set off the roses and also help to tide over the 'flower-less' periods with their own displays of flowers and foliage.

This apart, while planting roses in a landscape, we should avoid restricting ourselves to one dimension only, i.e., planting only bush roses without variations of height so necessary to catch the eye. An attractive rose garden requires emphasis on the vertical dimension. Apart from bush roses we require roses as standards, and roses as pillars, apart from roses as climbers. Some of the great rosarians of the past were quite aware of these concepts which, when aesthetically employed create garden pictures of lasting impact. I still remember, after 50 years, the exquisite effect of a line of the white Tea rose, 'Molly Sharman Crawford' budded as standards, set off admirably by blue pansies at ground level, in Dr B.P. Pal's garden in New Delhi.

Similarly, climbing roses so neglected in our gardens can produce spectacular effects even without elaborate structures. Climbers like ‘Maréchal Niel’ over the simplest rustic supports make an eye-catching display with their hundreds of blooms, as was demonstrated by Mr. Mushti Laxminarayana, Hyderabad’s great gardener, in the 1970’s.

Again, pillar roses, for example, varieties like ‘Prosperity’, or the Hybrid Perpetual ‘Frau Karl Druschki’ make a pleasing contrast to reds of bush roses. Of course, nothing can really beat the visual impact of rose pergolas. But these require elaborate structures, beyond the average gardener.

In the craze for growing Hybrid Teas, the charms of simpler roses which flower much more profusely are quite often overlooked. Varieties like ‘Summer Snow’, white, ‘Echo’ and ‘Ahalya’ in pale pink, and ‘Chatillon Rose’ and ‘Lutin’ in dark pink are most effective when planted in groups of several plants. If one favours the yellow shades, shorter floribundas like ‘Bright Smile’ can make quite an impact. There used to be a beautiful group of these in the Nagpur Engineering College.

Some of the slightly taller polyantha type roses such as Chiplunkar’s vermillion ‘Akash Deep’ and the almost coral red ‘Sanjith’ from Kasturirangan could also be utilized effectively, not to speak of more exotic colours like the violet ‘International Herald Tribune’.

Many of the old China roses, for example, ‘Archduke Charles’ which starts pale pink and finishes almost red, or that rose of Chinese silk paintings, ‘Old Blush’ also form effective garden plants.

Combinations of roses with other plants with contrasting leaf colour and flower form can also be most effective. In my Hosur garden, ‘Old Blush’ growing through a red leaved acalypha, forms an attractive picture as does the cream ‘Etoile de Lyon’, side by side with yellow lantana.

Some of the taller growing roses, e.g. the white ‘Alliance’ and the saffron orange ‘Lover’s Meeting’ can be used to good effect with tall pastel coloured hibiscus of the type of the ‘La France’ hybrids, white and pink.

There are numerous choices to make the edges of rose beds more attractive. Plants easily grown, for example, zephyranthes, in pink and yellow, and the ordinary amaryllis (not the huge Dutch ones) especially those in the greenish white and pale pink range can be thought of, as also perennial verbena in shades of lilac, purple and pink, or gazanias and gerberas. Many of the purple leaved shrubs also make an effective contrast plants to roses.

To add another dimension we could think of the shorter trees such as plumerias which contrast dramatically with roses.

All in all, there are no limits to originality in designing rose gardens. So mix the roses with lots of other plants but be careful to keep the aggressive growers at a safe distance from the roses.

May I conclude by saying that even if your rose garden consists only of roses in pots, a much better visual impact can be achieved if the pots are of various sizes and shapes, and some are raised on pedestals, whereas others hug the ground.

FIRMINGER’S ROSES

Article for the 1991 Bengal Rose Society
Souvenir on the ocassion of the XI All India Rose Convention

M.S.Viraraghavan

In the tercentenary year of Calcutta and on the occasion of the holding of the XIth Rose Convention it is appropriate to review certain portions of the history of rose growing in the city and neighbourhood. One of the carliest accounts available on this subject, at least to persons outside Bengal, is what is recounted in Firminger’s ‘Manual of Gardening for India’.

The Reverend Thomas Augustus Firminger, who is the author of this unique book, on horticulture in India, spent a large part of his working life, from around 1857 to 1858, in Calcutta and areas nearby, as Chaplain in the East India Company. As such, what he writes about rose gives us a very fascinating picture of roses growing nearly 150 years back in the city.

Before taking up his account of rose growing, it is appropriate to mention that Firminger was a pioneer horticulturist, was familiar with the ornamental and other plants in various parts of India, including Ferozepur (near Amritsar), the Nilgiris, Assam, U.P. as well as in the Deccan. So his work has virtually an all India perspective.

Firminger records in the 3rd edition of his book that “it must be within the memory of those now living that the gardens of Bengal at least, if not of all India, hardly possessed a rose worthy of the name. It is over 50 years ago that the 'Rose Edouard' was introduced. Previous to that there was nothing better to represent this lovely race than the China, the musk, and the Basohra (Bussora), putting forth a show of blossom for one short season and shabby and disagreeable all the rest of the year. The old beautiful so called summer roses of Europe, if introduced, were found unable to exist here. But a great change has taken place within a very recent period. Races of roses entirely new, the Teas and the Noisettes and the Bourbons have come into existence and happily found in India a home thoroughly congenial to them”. These remarks afford an invaluable insight into early history of rose growing in India.

The author deals with the propagation of roses under Bengal conditions in considerable detail including subjects like layering, and the taking of cuttings - including cuttings in water - as well as grafting and budding. Apparently the now standard practice of budding of roses was something not very common in those days in Bengal, where grafting (inarching) was the standard practice (and, perhaps this continues to some extent even today). Firminger makes an interesting observation that the lack of popularity of budding was because of the difficulty of finding a stock the bark of which would separate freely from the wood. He has suggested the following novel method viz., of using 'Rose Edward' cuttings a foot long of which 2/3^{rds} are buried in the ground. After the cuttings strike, the earth is removed partially and the budding done on that portion of the stock which had been below the ground and therefore had bark which could be lifted easily from the wood.

Talking of soil for roses, especially potted roses, he describes an experiment in which he made parings of doob-grass, laid them for several days to dry in the sun, pulled them to bits and then roasted them in an earthen vessel on a chulan (stove). “Using this abundantly with common earth and old cow manure, I have found not only roses, but other potted shrubs thrive in it most vigorously”. Clearly this method is based on the need to ensure good drainage under Bengal conditions – as readers would no doubt agree, the problem of waterlogging is to this day a serious problem of rose growing in this region.

In another interesting observation he refers to the methods of the ‘natives’ in cultivating roses. Apparently, earthen cylinders 16 inches in diameter and 2 feet long were used to plant roses. These were buried in the earth to a depth of 1 foot and filled with soil to within 3 inches of the rim. According to Firminger the method employed was to prune the roses drastically to within 2-3 inches of the roots in October, a week or two later to remove the soil from the roots and having left them exposed for a few days to fill in with a solution of oilcake of the consistency of thick mud. He records that plants under this treatment blossomed beautifully a month or so afterwards. But he adds discreetly that it is a mode of cultivation that perhaps would not suit everyone’s taste - referring to the stink of the decomposing oilcake !

Coming now to the rose varieties that do well in India, Firminger makes some very pertinent observations which continue to be relevant even to this day. He says “roses now in cultivation either belong to or derive their origin from two well defined groups 1) roses of Europe and Western Asia such as the old cabbage, French, and Damask roses, the general characters of which are that they bloom only in June and July, and 2) the roses of Eastern Asia such as the China, Bengal and Bourbon roses which bloom nearly throughout the whole year. Now, scarcely a rose of the first of these groups has been found to succeed in this country; while the roses of the second group as my observation goes, bloom far more beautifully in India than in England”. (I have deliberately underlined the above sentence). Yet we in India, have heartlessly abandoned roses of group 2 in favour of modern 'beauties' bred for colder climates. As those of you who have attended the Lucknow Rose Convention and heard Peter Beales, the well known authority on old roses, give his illuminating talk, illustrated with slides, the old roses making remarkable comeback, in England, and should they not become at least equally prominent in a country where they grow more beautifully?

Firminger also makes another remark on varieties introduced from the West which remain valid to this day. (He was of course talking of Hybrid Perpetuals and not of present day Hybrid Teas). “Many of these roses extolls in the catalogues of English dealers are in truth unworthy of notice; while many again, are so similar to others of a different name, that professional rose growers themselves can hardly distinguish them. In India too, this similarity it seems to me has a tendency to become even more positive, peculiarities that might perhaps be recognised in a European climate often becoming here entirely lost”. These are prophetic words indeed - and apply with even greater relevance in these days, here, we rose growers regularly succumb to the glowing descriptions in Western rose catalogues, and import more and more roses which are different from each other only in name and for the most part entirely unsuited to climatic conditions in India.

What are the rose varieties which Firminger describes as doing well in India? As I noted earlier, he was a widely travelled man and had confined his interest not only to garden roses but had cultivated various species. Among the rose species he talks of the golden rose of Persia, *Rosa foetida* being grown by him successfully in Ferozepur (from buds received through the post from Peshawar), of *Rose laevigata*, which he calls *Rosa ternata*, the white and yellow Banksian roses, the swect briar or Eglantine - *Rosa rubiginosa*, and *Rosa multiflora*. It is of interest to note that he had grown and gives an accurate description of *Rosa involucrata* (*Rosa clinophylla*) which he describes as a bramble, (raspberry) like plant with small pale yellow green pretty foliage .. bears in February a profusion of white flowers like those of the dog rose, quite single’. This, of course, is the rose which, in recent years, rose breeders have been extolling as a species likely to lead to a race of heat tolerant roses if its genes could be incorporated into modern roses. Clearly, nothing much has happened in 150 years.

Regarding rose varieties, Firminger talks of many (included some added by a later hand) with which at least the older readers would be familiar. Among the Hybrid Perpetuals he refers to well known roses like 'Général Jacqueminot', 'Madame Masson', 'La France' (now classified as H.T.), 'Paul Neyron', 'Black

Prince', and several others. Among Bourbon roses he extolls the virtues of 'Rose Edward' and praises also 'Souvenir de la Malmaison'. Some of the roses of this group which he describes are doing well in Calcutta include 'Gloire des Rosomanes', a single red “of which hedges are found in the Botanical Garden in Ootacamund”. I can assure you that not a single plant survives today in this Botanical Garden. Pheolina Bourboniana, which is described as a common rose in Calcutta similar to the last, Mrs. Bossanquct, called ‘Khurapeel’ which he describes as “white with petals overlapping with beautiful regularity as in a camellia, perfect in form and one of the loveliest roses we have”. I wonder whether this is still grown in Calcutta.

Coming to China roses, he talks of 'Cramoisi Supérieur' “with large completely double flowers of brilliant scarlet with petals like satin velvet unequalled in colour by any rose we have”. I wonder whether this variety is to be found anywhere in Calcutta – it, or a variety quite similar is grown in large numbers in Delhi. Another wellknown China rose which he describes is the ubiquitous 'Archduke Charles', with the charäcteristic of opening white and turning to dark dull crimson a day or two later.

As regards the Tea roses, many varieties still grown in different parts of India are referred to, including 'Devoniensis', with white camellia form flowers, 'Safrano', the copper coloured Tea rose which he describes as “exceedingly common in Ootacamund”. There are, indeed, several plants still in the similar climate of Kodaikanal. 'Glorie de Dijon', the climbing Tea rose 'Madame Falcot' with pale apricot flowers, 'Catherine Mermet', 'Sombreuil' and many others. He refers to a variety 'Elise Sauvage' called 'Odorata' in Calcutta which he says is one of the most lovely roses known producing large globular pendulous flowers, creamy white outside and of a rich apricot yellow within. It would be good if this is still available in Calcutta.

Coming to the closely related Noisette class, many familiar varieties such as 'Aimée Vibert', white, 'Solfatare', which is again described as common in Calcutta with large handsome pale lemon flowers, 'Lamarque', quite similar to the last. Incidentally, 'Lamarque' grows to perfection in Kodaikanal. He also talks of some of the most famous Noisettes which are still available, such as 'Maréchal Niel', 'Cloth of Gold' (both yellow), and 'William Allen Richardson' which in its day was a unique rose with the most distinctive apricot orange colouration, and observed “to do well in the Deccan”.

May I conclude by suggesting that it would be a worthwhile project if some ardent rose growers in Calcutta could assemble the varieties described by Firminger and other pioneer writers on rose growing in Bengal, in one place. Such a collection would invaluable material for hybridizers when, and if, a project of breeding with *Rosa clinophylla* begins in earnest in India.

After 1868 Firminger left for England and continued his gardening at Edmonton near London. Apart from his keen interest in horticulture he was apparently a very able painter and had done numerous paintings of North India scenes, some of which were good enough to be exhibited at the Royal Academy in London. He passed away in 1884 at the age of 72. But clearly, the family was much attached to India because even his son, Walter Kelly Firminger was a priest in Calcutta in the early years of this century.

A ROSE GALLERY FROM INDIA

Written for South Australia Rose Society talk, 2001

M.S. Viraraghavan

Roses are grown with great enthusiasm and passion all over India. But first, in order that you may understand better, I would like to highlight certain aspects of India's climate. A well known authority on roses has divided India into 8 agroclimatic zones, but, as you can imagine, there are many microclimates within each zone. But the 2 most distinguishing features are the monsoon, which are winds blowing from the south west bringing India most of its rainfall from June to September, and the Himalayas, that great mountain chain with an average height of about 20,000 feet, which form the northern boundary of the country, stretching for about 1500 miles west to east. The Himalayas which are home to almost all India’s wild roses, represent an amazing variety of climates from ice deserts in the extreme west adjoining the Tibetan Plateau, to places like Cherrapunji in the extreme east which has the world's highest rainfall of 500 inches.The existence of the Himalayas has a profound effect on the Indian climate. During the summer and monsoon months they effectively stop the movement of the southern winds into central Asia, thereby greatly increasing heat and rain. In winter the range blocks the movement of cold air from the heart of Asia and consequently temperatures do not fall as low as you would expect from the latitude.

As I mentioned earlier, the Himalayas are home to a variety of rose species. In the extreme west we have the golden rose, *R. foetida* (more popularly associated with Iran), as also *R. ecae*, again bright yellow in colour but much smaller. But the most typical rose of the dry western Himalayas is surely *R. webbiana*, with lilac pink flowers inhabiting the most stony inhospitable places at altitudes around 10,000 feet; the flowers of incredible grace contrasting admirably with the rugged landscape. Progressing eastwards, we have *R. macrophylla*, so named for its large leaves with spectacular flowers of dark pink verging on red – “as large as a man”s hand, and one of the most beautiful of Himalayan plants” as described with gusto by Sir J.D. Hooker, the British botanist during his pioneering travels in the Sikkim Himalayas in June 1849.(1).

I still remember the thrill with which I first saw *R. macrophylla*, when, on the way to the Valley of Flowers - an alpine valley which boasts of a tremendous variety of flowers, including the startlingly beautiful blue poppy, meconopsis –, on turning round a sharp bend in the mountain track, I came across a bush of *macrophylla* in full bloom. In fact, I saw the reflection first, of the flowers, in the ice-cold waters of the Pushp-Ganga, - the “Flower Ganges” – a stream originating from the Valley of Flowers.

The central Himalayas are also home to *R. sericea*, which, as you probably know, is the only species with flowers of 4 petals; as also *R. brunonii*, the Himalayan musk rose with extra vigorous growth and almost purplish foliage contrasting with the milky white fragrant flowers. Going further east, we have one more of the musk rose clan, *R. longicuspis*, with beautiful evergreen foliage. This rose, or its close relative, *R. mulligani*, is the one which adorns the White Garden at Sissinghurst, England. But the most typical, and indeed the most spectacular rose of all is surely *R. gigantea*. Graham Stuart Thomas' “Empress of wild roses” which is found in the extreme east where the Himalayas merge into the mountains of India's North-East, adjoining Burma (Myanmar). This giant rose growing to almost 50 feet into the forest trees with stems as thick as a man's arm is charmingly described by Sir George Watt, India's first Surveyor-General and keen botanist, who first came upon it in 18 82 as growing through the treetops and producing such a profusion of giant golden flowers as to make the trees look like golden magnolias from a distance.(2)

Talking of musk roses we have one more representative in the southern mountains where I live, – *Rosa leschinaultiana*. It has large white flowers and most distinctive plum purple stems.

But the most interesting of India's wild roses is undoubtedly *R. clinophylla*, which has lovely evergreen foliage and white flowers with an extraordinarily intriguing scent of acetone (nail polish remover). More on this species and my work with it later.

As you can imagine the plains of India are generally too hot to grow species roses, though some like *R. laevigata* and *R. banksia* are grown, especially in north India. But some of the heritage roses, and particularly the Tea/China as well as studier Bourbons and Hybrid Perpetuals are widely grown. Despite the craze for things modern – including roses – so typical of a rapidly developing country, heritage roses hold their own, largely because of their use in worship, in festivals, as also in the manufacture of various rose products.

Some of the old roses which do well include the Teas – 'Madame Falcot', 'Mrs. B.R. Cant', 'Devonienses', 'Lady Hillingdon', 'Etoile de Lyon', as well as the great Tea Noisettes – 'Maréchal Niel', 'Lamarque', 'Céline Forestier' and a few others.

The Chinas are well represented with varieties like 'Archduke Charles', 'Cécile Brunner', and 'Perle d'Or'. Among the Bourbons, we have the first one, 'Rose Edward' growing throughout India as also 'Souvenir de la Malmaison' and 'Gruss an Teplitz' grown both in the east and west. Among the Hybrid Perpetuals, the popular ones are the huge 'Paul Neyron', which does particularly well in central and northern India as well as 'Frau Karl Druschk'i. Fanciers still grow varieties like the two reds from Dickson - 'Hugh Dickson' and 'George Dickson', and many on the borderline of the old and new roses, like 'Kaiserin Auguste Viktoria', 'E.G. Hill', 'La France', 'President Macia' etc.

Coming to modern roses there can be no doubt that these are most popular both in home gardens and in public parks. Among the latter can be mentioned the lovely gardens of the cities of Bhopal and Chandigarh, the gardens of the Airports Authority of India and the Rose Society of India, both in the capital city of New Delhi. A spectacular addition to India's public rose gardens is the Centenary Rose Park in the hill station of Ootacamund in the Nilgiri Mountains of South India, which has a temperate climate similar to yours. This park boasts of over 2500 rose varieties.

Popular varieties include a large number of Americans – 'First Prize', 'Gladiator' ('Uncle Joe'), 'Friendship', 'Paradise', 'Brandy', 'Gold Medal' and 'Oldtimer', as well as some of the European ones like 'Landora', 'Viamala' and 'Just Joey'. In New Delhi gardens even older varieties like 'Garden Party', 'Michelle Meilland', 'Christian Dior', and 'Mr. Lincoln' reign supreme. Some of India's rose nurseries have amazing collections of the latest roses, and one, K.S.G. Sons has a catalogue which lists over 1300 varieties.

But we badly require varieties with an “India signature”, that is, specifically bred and adapted for cultivation in our warm climate. Quite sometime back, India's premier rose breeder, B.S. Bhatcharji, talked of the need to evolve a separate line of breeding for heat resistant roses. This of course implies a conscious reversal of western rose breeding with its emphasis on winter hardiness.

When I started rose breeding in the 1960s I was very conscious of the Bhatcharji dictum. As it happened the first “hand-painted” rose, McGredy's 'Picasso' made its appearance at this time. While the flowers were spectacular in cold weather the unique markings almost disappeared when our weather was less than ideal, i.e. hot and humid, as is often the case. Again, to this day, Floribundas are not very popular in India, since the preference is for large flowered H.T.'s. So my emphasis from the beginning was on producing a H.T. type rose in the hand-painted strain, where the markings would not disappear in the heat.

Beginner’s luck resulted almost immediate success with 'Priyatama' (1981) with quite spectacular markings of H.T. form and size, from the cross of the red and white bicolour H.T. 'Inge Horstmann' (Tantau) into Picasso. This variety is in the background of most of my hand-painted roses.

Another rose breeding interest of mine was to evolve roses in unusual colours. What is the origin of colours such as lilac, brown and even green?

The famous English hybridiser, Le Grice has analysed this subject and come up with the intriguing theory that the lilac and purple colours arise when there is a complete admixture of colour (in the parent roses) with a considerable bias towards bicolours which derive originally from *R. foetida persiana*, as employed by Pernet Ducher. The browns arise from the parental breakup of of the lilac and purples.

The search for unusual colours started with intercrosses of the Bourbon 'Gruss an Teplitz' into several lilac roses hoping to combine heat resistance with unusual colours. Seedlings from this initial cross have been in the background of my subsequent work.

These special interests apart, many other roses have been released following standard hybridization techniques.

We now come to the crucial question of developing a separate line of heat resistant roses. It is obvious that mere intercrosses with Western rose varieties will not result in substantial improvement as the genetic base is not altered by such crosses. We have to add something new if the goal of heat resistance is to be achieved. To this end I have been working with the tropical rose species, *R. clinophylla* as well as the form of *R. gigantea* found in North-East India.

Work with *clinophylla* proved very difficult in the initial stages, but ultimately a breeding line was established. With the seedlings thus evolved as the basis, considerable progress has now been made. I will show you some of the seedlings resulting from this line of breeding.

I have also simultaneously been breeding with *R. gigantea* using as I said the Indian form which has pale yellow flowers rather than the white form originating from South China and Burma. This species has tremendous vigour as well as lovely evergreen foliage but from the breeder's point of view it has the incomparable advantage of being easy to cross with many modern roses, for the obvious reason that it is one of the stud species of the modern rose. The high centred form of modern H.T.'s is clearly due to the influence of *R. gigantea*.

The final step in the evolution of the ideal heat resistant rose is of course to bring the two lines together. As a beginning seedlings of the cross *R. clinophylla* into *R. gigantea* have been raised of which one has flowered with cream coloured flowers of the *R. gigantea* type.

HUNTINGTON TALK

Talk at the Huntington Gardens and Library, Pasadena California, USA, when Girija and Viru were honoured with 'The Great Rosarians of the World' Award on January 22nd 2006

Girija and Viru Viraraghavan

Girija's part:

"Oh! No man knows through what wild centuries roves back the rose" as Walter de la Mare so rightly said.

A charming thought, but somewhat aggravating to rose lovers who would like to know when the fascination of man for roses started. Even more frustrating for an Indian rose historian like me is the fact that there is no written record in India covering periods where civilization was otherwise greatly advanced, like the Indus Valley Civilization (2500-1500 B.C.). But obviously the association of roses with India's history goes back to well over 5000 years. But, as earliest Indian history is based on oral tradition and not the written word, one has to depend on traditional myths, legends and folklore.

One such legend, widely related even today, harks back to the time when the Gods were said to live on earth. Brahma, the God of Creation, and Vishnu, the God of Protection had a debate about which flower was the most beautiful. Brahma favored the lotus while Vishnu preferred the rose. Upon being shown the arbor laden with fragrant roses in Vishnu's celestial garden, Brahma conceded the argument.

The presumption that such legends are rooted in reality is reinforced by the fact that the abode of the Gods has always been considered to be the Himalayas - this 2500 mile long sweeping chain of snow capped mountains, stretching from the north west to the north east of India, is also home to many wild rose species.

References in the medical treatises of the doctors, Charaka, a physician and Susruta, a surgeon - they are together the founders of Ayurveda - the Indian system of medicine - ('ayurveda' literally translates as the 'science of life') who are believed to have lived in the first century before Christ, gives ample proof that roses were known in those days. The rose was known by many names, in the language of those times, Sanskrit, and each name was in fact an adjective symbolizing a particular characteristic, of its curative efficacy for a particular symptom or illness. Thus it was considered to be cooling, a laxative, an appetizer, it cured fever and boils, it lessened stomach burning.

Many other texts mention the rose in different contexts. One called 'Kashyapa's Agricultural Treatise' lists the rose among other plants, trees and climbers that a king should plant within his kingdom. Another manuscript (Chakrapani Misra's 'Visva-vallabha') states that the rose is an indicator of underground water.

When Alexander the Great invaded India, on its north west border in 327 B.C., it is said that he was amazed at the wealth of plants he beheld, and among others he sent back some rose plants to his mentor Aristotle.

Coming into the Christian era, the monk Vatsyayana, who wrote the 'Kama Sutra' (A Manual of Love) around 100 A.D., gives a list of the duties of a virtuous wife, and one of them is to tend a garden, which would have a number of flowering and fragrant plants, and the rose is one of them.

The poet Kalyana Malla's book, 'Ananga Ranga' (written about 1172 A.D.) describes the ambience of a room best suited for amorous interludes, and mentions the lavish use of rose water. Both these books have been translated by Sir Richard Burton .

Though Avicenna (Ibn Senna) of Persia is credited with the discovery of rose water by distillation, the Ayurvedic text of Charaka, the doctor, has references to rose water, and the Buddhist sage, Nagarjuna, who was an alchemist, describes the process of distillation in his scientific treatise, Arkaprakash.

The rose used in those bygone days would have been what was later referred to as *Rosa damascena var. semperflorens*, or the Autumn Damask, or the 'monthly rose' – not the Kazanlik rose. Even today, rose water is made in India from a present day hybrid of this rose called the "Bussorah' rose.

Following slide:

Rose Edward. This is called 'Panneer' rose. 'Panneer' means rose water.

'Rose Edward'

Trade with China existed from around 1000 B.C. as many Chinese scholars came to the land of the Buddha. When the Buddhist travelers Fa Hien and Hiuen Tsang (5th and 7th centuries) visited many of the sacred places associated with the Buddha, they mention the beautiful gardens, replete with roses and many other flowers and fountains, which they saw and marvelled .

The ‘Gita Govinda’ of poet Jayadeva (written in 1150 A.D.) and translated by Sir Edwin Arnold (who is more known for his “Light of Asia’’) is replete with references to roses.

A Muslim traveler to India, Rashid-ud-din (1247-1317) who is considered to be the most reliable of Persian historians (by Percy Browne) visited the western Indian state of Gujerat in 1300 A.D. and remarked (I quote) ‘the people are very wealthy and happy and grow no less than 70 kinds of roses’.

From the 14th to the 16th centuries one of the greatest and most splendiferous of dynasties was the Vijayanagar Kingdom of southern India. Two Portuguese travelers, Domingo Paes and Fernaz Nuniz who visited this kingdom in 1537 were amazed to see that roses were integral to the daily life of both aristocrats and commoners. They saw plantations of roses in the countryside, and the bazaars of the capital city of Hampi had many shops with baskets laden with roses. Men and women adorned themselves with roses. And the king of the time, the mighty

Krishna Deva Raya, a great scholar-poet-warrior, dressed in silken robes of pure white embroidered with golden roses, would, every morning, when he gave audience, shower his favorite horses and elephants and courtiers, with white roses. The king’s bedchamber (and I quote) ‘had pillars of carved stone, the walls all of ivory, as also the pillars of the cross-timbers, which at the top had roses carved out of ivory, all beautifully executed and so rich and beautiful that you would hardly find anywhere another such’.

Another traveler, Abdur Razzak who visited this kingdom earlier in 1443 writes ’Roses are sold everywhere. These people could not live without roses and they look upon these as quite as necessary as food’.

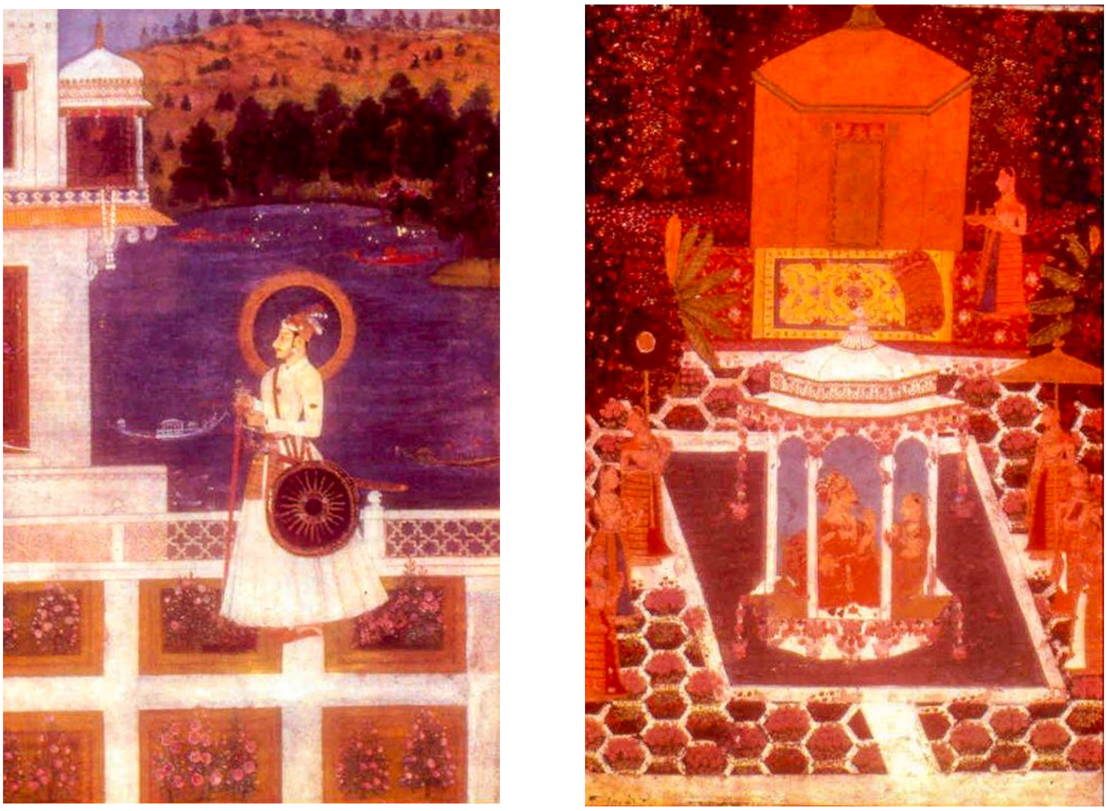
In the 16th century the Muslim Mughal emperors came from Persia and Afghanistan to rule India. The first emperor, Babur, (1483-1530) brought camel loads of roses - most probably musk and damask roses. His love for roses is epitomized by his poem:

‘My heart, like the bud of the red, red rose,
Lies fold within fold aflame;
Would the breath of even a myriad Springs
Blow my heart’s bud to a rose?’

He was so enamoured of roses that he named all his daughters rose adjectives – Gul chihra, Gul izar, Gulbadan and Gul rang. Gul means rose in Persian.

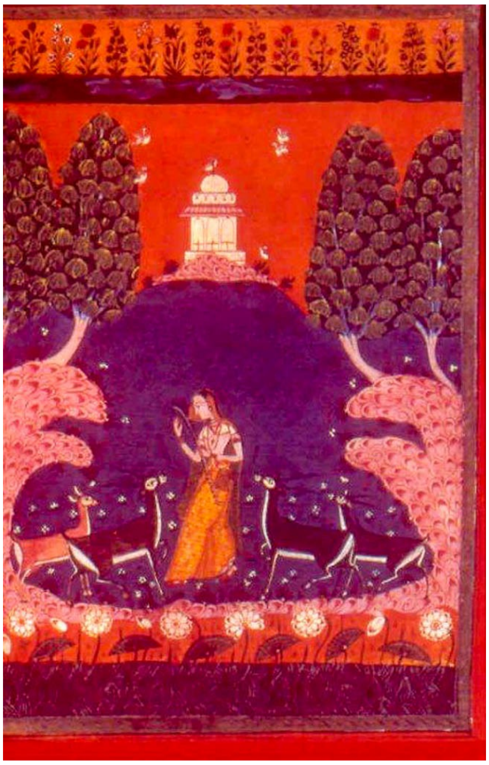
Painting in honor of Princess Gulbadan, Babur's daughter

Babur developed the formal geometric ‘char bagh’ (four quadrants) design of Mughal gardens, where many roses were planted. This style was refined by later kings and the Mughal gardens in Kashmir - the Shalimar garden, and in Agra, in the Taj Mahal and in Delhi, the capital were world famous.



Mughal style flowerbeds, unknown artist, 17th century

Border of Roses on this painting of Maharana Jagat Singh of Udaipur, Rajasthan, 174



Border of roses on this 17th century, Malwa School of painting, called Todi Ragini

Emperor Akbar (1556-1605) invariably took camel loads of roses to give to the wives of his allies.

The next Mughal Emperor Jehangir’s wife, Nur Jehan is credited with the discovery of rose oil, called attar in Persian, while she was taking a rose scented hot bath.

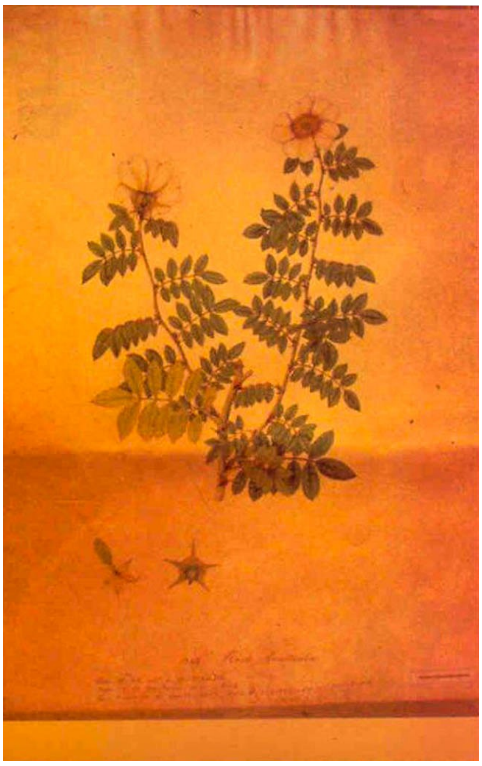
The finest of rose liquers was distilled for the aristocracy – about 20,000 flowers for one bottle of liquer.

Manucci, the 17th century Italian traveler was amazed to see that the nobles not only used huge quantities of rose water and oil on themselves, but even rubbed their horses with these as a matter of course.

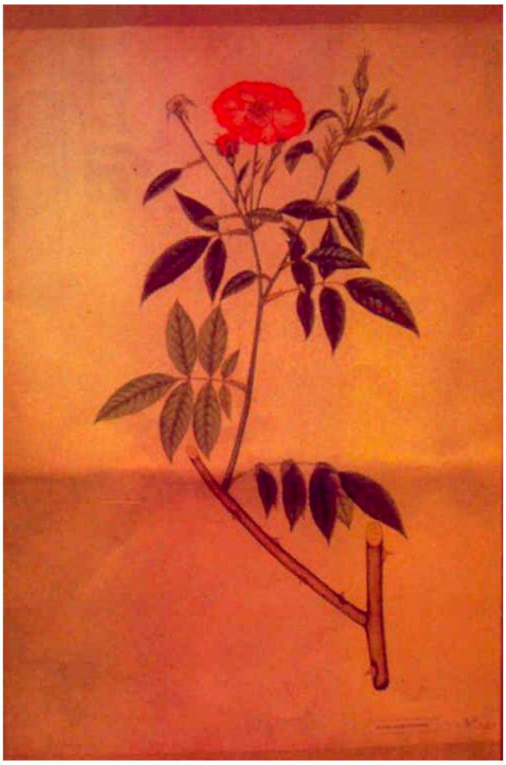
Nearly every painting of this period shows the subject of the painting holding a rose in his or her hand.

When the British came to India, in the 17th century, originally as a trading company - the East India Company - their ships from China, carrying merchandise – tea and opium - to England would stop over at Calcutta on India’s east coast. Most of these ships carried live plants including roses, and they would be kept in the Botanical Garden in Howrah, near Calcutta, to recover before their onward journey to England. This botanical garden was started by Sir William Roxburgh in 1793. His book, ‘Flora Indica” published in 1832 mentions many rose species as growing in the garden. Many would have come from China, as did 'Fortune’s Double Yellow' and other Chinas and early Teas. Quite a number of these are still available in old nurseries and Viru and I are systematically collecting all these old roses – all nameless!

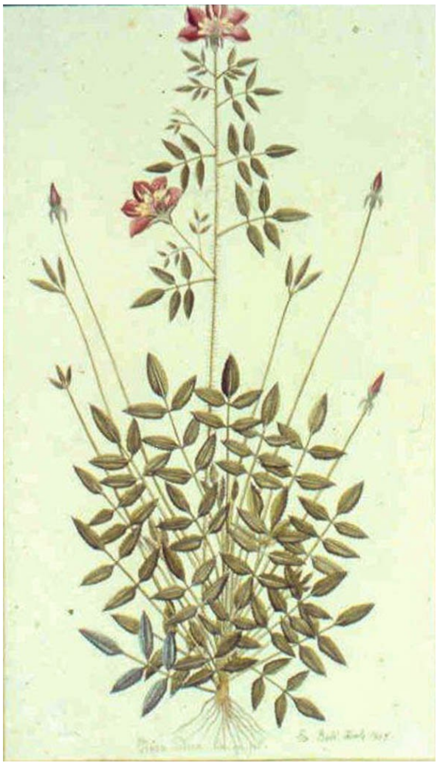
Rosa macrophylla
Painting
commissioned by
Roxburgh, Calcutta
Late 19th century



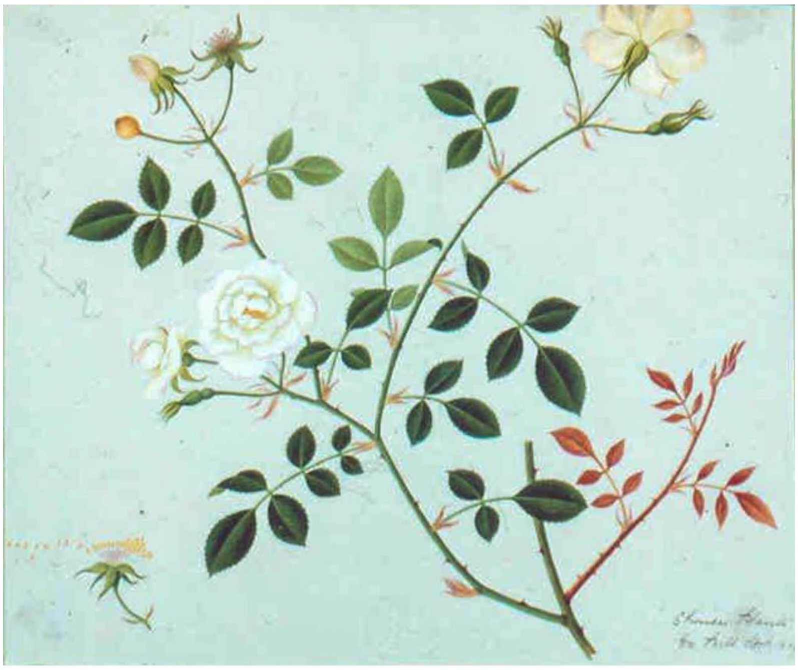
Painting of *R. bracteata*, commissioned by Roxburgh. Calcutta. Late 19th century



R. chinensis. Painting commissioned by Roxburgh, Calcutta, late 19th century



R. indica semperflorens, 1867. Painting commissioned by Roxburgh, Calcutta.This was 'Slater's Crimson China'



Chinese Plants-painting commissioned by Roxburgh, Calcutta, late 19th century

Indian plants purchased from Mr. B. Probably from Claude Martin's collection, 1899. Roxburgh, Calcutta

Painting of an unknown rose by a Chinese artist, commissioned by Roxburgh, Calcutta, late 19th century

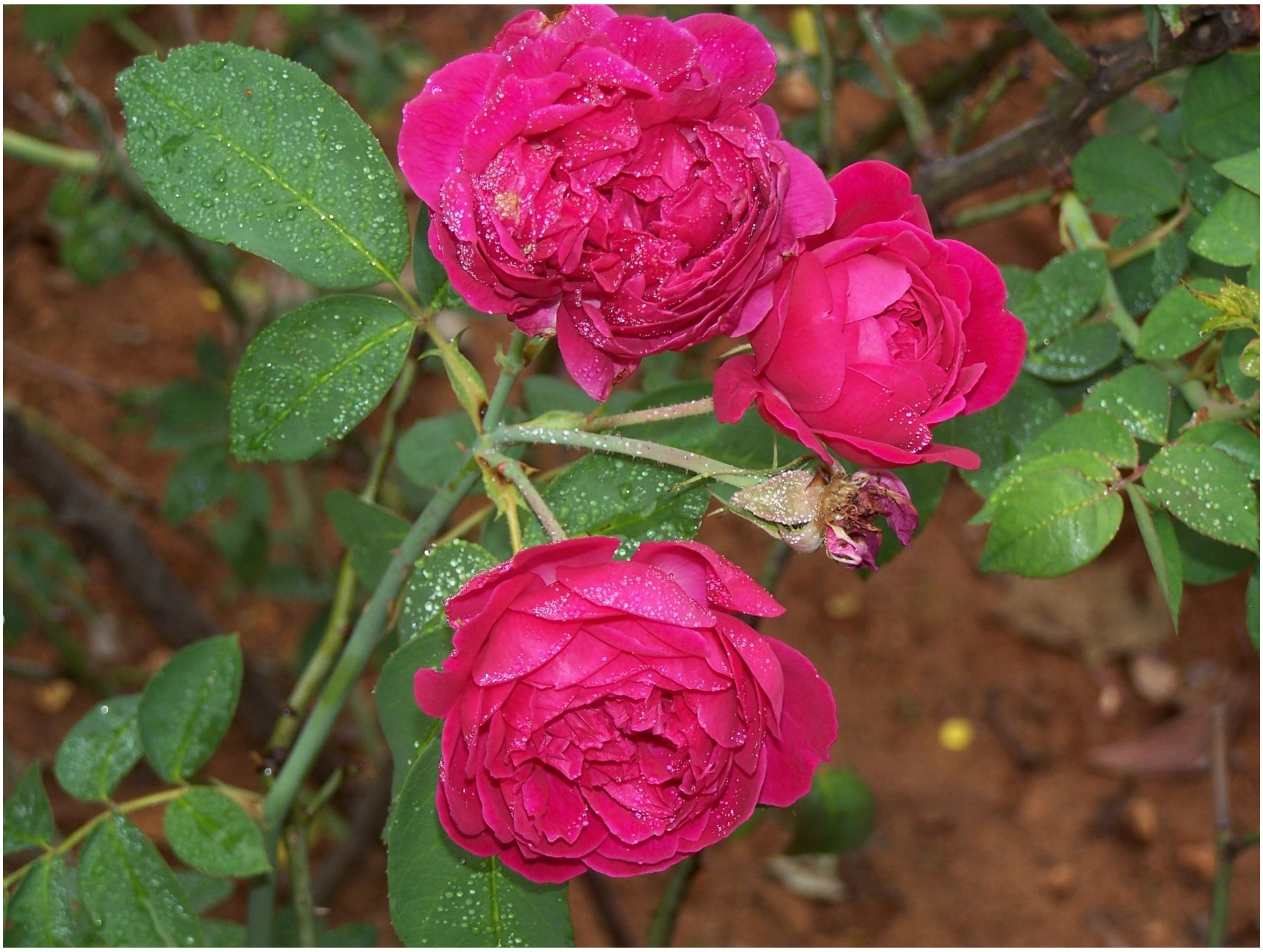
Rosa roxburghii has been named in the honour of William Roxburgh.

Indeed, *R. laevigata* – your Cherokee Rose - was introduced into the U.S. by the East India Company in 1759.

Indeed, import of roses from China must have started much before the days of the East India company by the land route - the Silk Route - and by sea during the heyday of the Chola dynasty of South India (1000A.D.).

Even today there are a number of ‘mystery’ roses that do not appear to be what came from China to the Calcutta Botanical Garden. An interesting example is the red rose used even today in garlands. Another is the white rose of Vijayanagar mentioned earlier. Which must obviously have been a Chinese import as it was used on a very large scale during the festival of Dussehra which falls in October. Clearly, a repeat flowering white rose.

Sadly, even more recent introductions have been lost, like the fascinating double form of *R. clinophylla* mentioned as common in northern India by Rev. Firminger, in the 1900’s.



'Kakinada Red'

From trade, the East India Company metamorphosed into a colonial power, fighting local kingdoms and annexing vast tracts of land so that by the 1900's India was ruled by the King of England.

One such king, in the deep south of India that the British fought and vanquished, was Tipu Sultan, a Muslim king who ruled the state of Mysore from 1749 – 1799. Tipu was a great lover of plants and especially of roses and he named his garden 'Lal-Bagh, which means the Red Garden, because of its huge beds of red roses. We surmise that they must have been repeat-flowering Chinas, as the hot summers and very mild winters would have killed any once flowering varieties.

Tipu Sultan with rose in Dariya Daulat mural

The British, as indeed other Europeans – we had the French, the Dutch and the Portuguese annexing territories in India - were great botanists, and they plant-collected all over the country. *R. clinophylla* (called *R. involucrata* then) was sent to Roxburgh in Calcutta by Francis Buchanan Hamilton in 1803. There is an interesting description in 'The Book of Roses - A Rose Fancier's Manual' (1838) by a Mrs. Gore: I quote 'The parched shores of the Gulf of Bengal are covered, during the spring, with a beautiful rose, found also in China and Nepal. The flowers of the *Rosa involucrata* are white, solitary, surrounded with a collar of three or four leaves, out of which they seem to emerge; while in the vast thicket of the beautiful *Rosa semperflorens* (a native also of China) the tigers of Bengal and crocodiles of the Ganges are known to lie in wait for their prey'.

R. gigantea, the 'Empress of Roses' as Graham Stuart Thomas called it, was discovered by Sir George Watt, Surveyor General to the British India Government, in 1882 in Manipur in north-east India. But it was introduced by General Sir Henry Collett in 1888 who sent seeds to the Calcutta Botanical Garden, which in turn sent them to Kew and to Monsieur Crépin, the taxonomist in Brussels.

HUNTINGTON – Viru part:

The period of British rule (1600-1947) also saw the establishment of great rose collections. One of the most outstanding was Sims Park in Coonoor in the Nilgiri

Mountains of southern India, established in 1874. Even as late as the 1950s this garden boasted of a comprehensive collection of many of the early H.T'.s, including a large number of the Pernet hybrids. I still recall the excitement with which I beheld for the first time, in 1951, the blooms of the golden yellow 'Julien Potin'. There were many others like the excellent specimens of the bicolor 'Condesa de Sastago' and the creamy yellow and red 'Reverend F. Page Roberts' (H.T. 1921). An impressive garden feature was the giant standards of the H.T. 'President Macia'- enormous flowers in shell pink, but yet endowed with an amazing elegance, no doubt the gift of its immediate parent, 'Ophelia'. I still grow it and it can be found flowering happily in many an otherwise neglected garden in our hills.

The same Nilgiri Mountains had a fantastic collection of over 1500 roses owned by the Maharaja of Pitapuram, a princely state.

Sir Edwin Lutyens, the famous British architect who designed the Viceregal Lodge in Delhi in the early 20th century (which later became the President of India's official residence) also designed and laid out, around it, a magnificent Mughal style formal garden which boasted an array of roses. This garden is open to the public every Spring.

Soon after Independence, in 1947, a spanking new capital was built for the state of Punjab (north India) by the well known French architect, Le Corbusier and a beautiful 30 acre rose garden laid out. This is now called 'The Zakir Hussain Rose Garden' named after a President of India who was a connoisseur of roses. A feature of this garden commented upon rapturously by the English author Hazel Le Rougetel talks of her sitting in the shade of the climbing Noisette, 'Maréchal Niel'.

Much more recently, in 1995, was started the Centenary Rose Park in Ootacamund in the same Nilgiri Mountains mentioned earlier, which has over 2000 varieties, mainly modern roses.

You would have seen photographs of some of these gardens in the Exhibition mounted by Clair.

The rose movement in India gathered strength with the establishment of many rose societies including the doyen of them all, the Rose Society of India, in Delhi. An apex body, the Indian Rose Federation, representing these societies, was founded in 1978 and a rose annual, which highlights developments in the rose world, both Indian and global, is published in time for the annual national rose convention held every January.

One outstanding innovation which contributed to the growth of the rose movement, was the 'Polybag' method of rose propagation, which was the brain child of Mr. N.A. Joshi, an engineer, not a horticulturist, of Western India. A flow chart showing how this is done is in the Exhibition. Without exaggeration, some millions of roses have been budded by this method. May I add that planting roses dispatched bare-root in the tropical warmth of India is a heartbreaking experience for most rosarians, and so the polybag method was very timely indeed.

So far we have been concerned with the past and the present rose scenario in India. But the emphasis of this talk is really on future development. The philosophy of the new wave of rose experimentation in India mirrors, interestingly enough, what the imperialist British author, Rudyard Kipling, wrote: ‘East is East and West is West and never the twain shall meet’. Without getting into the cultural veracity of this, there is no doubt that Western roses are hardly suited for the Eastern situation or, for that matter, Northern roses for Southern climates like yours. On the latter subject, many American writers have lamented on the craze for modern Hybrid Teas, even in the warmer parts of the U.S. overlooking the pristine merits of the warm climate roses of yesteryear – the Chinas, the Teas and the Noisettes.

The same trend prevailed in India too, and, it is pertinent to point out that with every generation of the modern Hybrid Teas, raised with the objective of cold tolerance in Europe or the U.S., the Hybrid Tea becomes less and less suited for the warmer parts of the world.

A separate line of breeding is clearly required and the need for such a line was explicitly enunciated for the first time as far back as 1930 by India’s premier rose breeder, Mr. B.S. Bhatcharji. Much earlier, a well known English horticulturist, Rev. Firminger, who was based in Calcutta, wrote in 1904 in his ‘Manual of Gardening for India’ that roses belong to two well defined groups - one, the roses of Europe and Western Asia for example, the French and damask roses, and, two, the roses of eastern Asia such as the Chinas, Bengal and Bourbon roses. I quote him: “ Now, scarcely a rose of the first of these groups has been found to succeed in this country, while roses of the second group, as far as my observation goes, bloom far more beautifully in India than in England”.

It is good to remind ourselves that when we talk of roses in India we are talking of a flowering season which extends from early winter (November) to spring (March). If an Indian were to write an ode to the rose, a la Thomas Moore, he would extol the first rose of winter, not the last rose of summer!!

Bhatcharji’s dictum made a powerful impact on me, as did the sage observation of the great Wilhelm Kordes, of ‘Crimson Glory’ fame, who observed that the soup ladle would only bring out only what was in the soup tureen. Which, of course, means that fresh blood is needed if real progress is to be achieved.

Before taking up this matter of warm climate rose breeding it is appropriate to mention the pioneer Indian hybridisers. The first notable one was Bhatcharji and one of his most famous roses is the extravagantly fragrant red rose ‘Sugandha’ which was pictured in a series of rose stamps issued by the Indian government.

'Sugandha'

Bhatcharji was a pre-Independence figure but it was the eminent agricultural scientist, Dr B.P. Pal (1906-1989) who really pioneered modern rose breeding in India. Dr Pal, who rose to become the Director General of the Indian Agriculture Research Institute, in New Delhi, a premier facility, was an ardent lover of roses. In a rose career starting from a childhood spent in Burma, Dr Pal was involved in growing and breeding roses for over 27 years. He talks in his book, The Rose in India, 1st edition, 1966, of how he was able to grow roses such as ‘Frau Karl Druschki’ and ‘Climbing Captain Christy’ in the warm monsoon climate of lower Burma in stiff clayey soil. Dr Pal contributed immensely to the Indian rose scene by his own breeding work and by initiating similar breeding in the Indian Agriculture Research Institute.

Indian Agriculture Research Institute

I am proud and honoured to have known him and to have been encouraged by him in my efforts. I cannot resist quoting what he wrote about my work; " Whereas most other breeders, whether working in nurseries, institutes or on their own, have tended to adopt what I call the safer 'bird in hand' policy, as regards the selection of parent varieties for their crosses and their objectives they set themselves, Viraraghavan appears to have agreed with Bret Harte who wrote 'a bird in the hand is a certainty, but a bird in the bush may sing'". "May sing" is right - I am still waiting for my signatur tune !!!.

Notable hybridizing has also been done, and, happily, is still continuing, by Mr. G. Kasturirangan, the owner of India's largest rose nursery. His catalogue lists over 1500 varieties.

KSG Sons

In western India and in Bengal too there are many amateur rose breeders. However their emphasis is on producing more Hybrid Teas rather than taking advantage of the excellent possibility of breeding new forms of the great roses of the East.

All of us are united in our anxiety that the rose should remain the world's favorite flower, but will this happen? The reality is that economic development is taking place rapidly in the warmer regions of the world, but without roses. A typical example is the otherwise garden loving state of Singapore, where obviously the people are very fond of gardening, but there is hardly a rose to be seen. Clearly roses suitable for tropical regions are in short supply.

Recently I met a horticulturist working in the botanical garden in Pattaya on the Thailand coast, who told me that they grow only one rose - a traditional but unidentified pink variety.

Obviously breeding to evolve roses for warm climates is a must.
What should be the objectives?

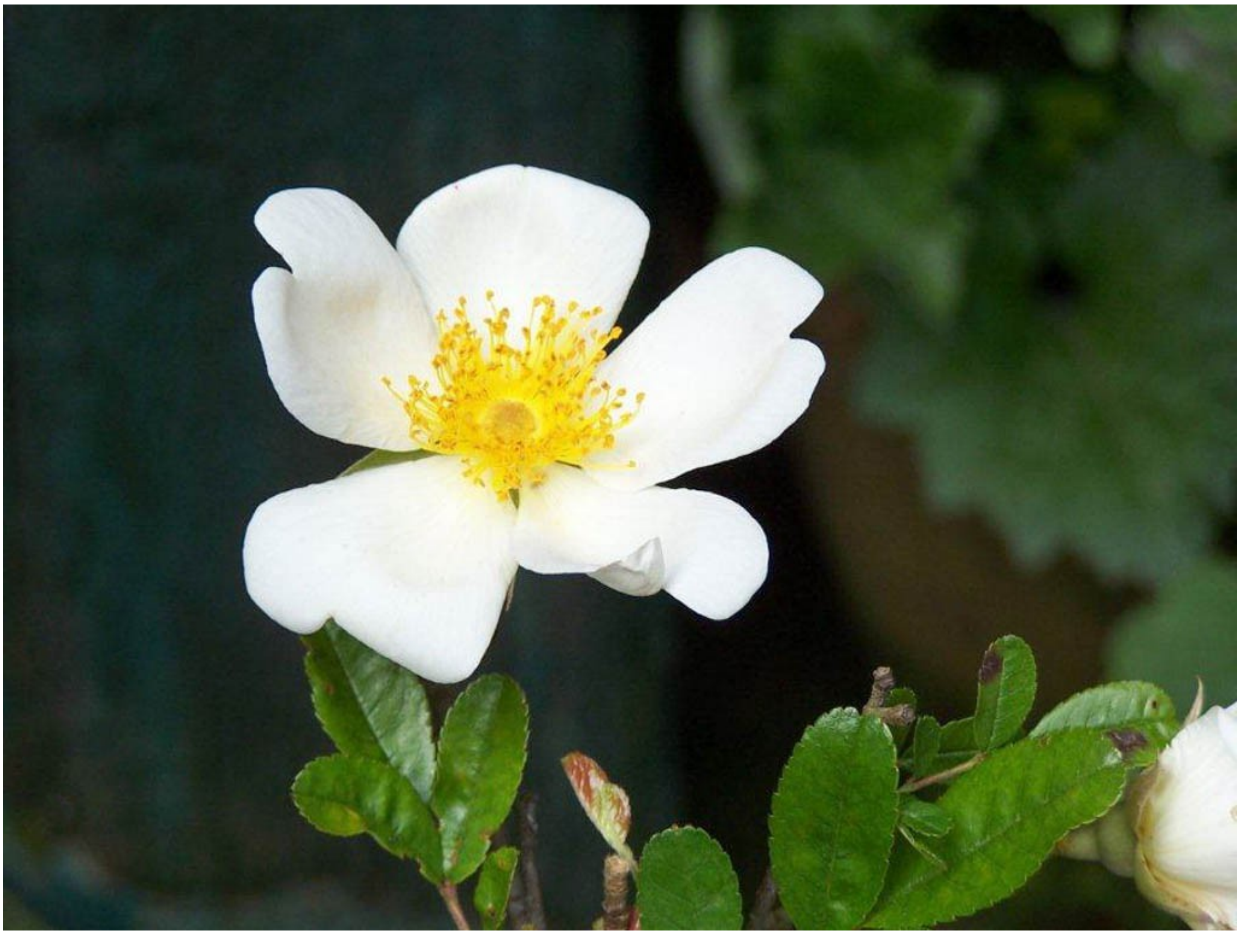
The emphasis has to be on creating heat resistant roses which fit happily in the modern garden along with many other flowering and foliage plants. For this we need roses with better plant habit, bushy and free flowering, with fragrant flowers, in a much wider color range than the traditional Chinas and Teas, but more than anything else, it is the foliage that is of vital importance in a tropical situation. Tropical plants are endowed with beautiful evergreen foliage and the rose must be one such. Unless we make roses with disease resistant evergreen foliage which will look good even when not in bloom, the chances of the rose being widely planted in warm climate are dim indeed.

You may ask: is this possible? I have no doubt in my mind that it is in eminently feasible to produce roses with outstanding foliage. A most encouraging feature of the rose world is that evergreen rose species, which will have to be the foundation for evergreen garden roses are all natives of the warmer parts of the world. Species like *R. clinophylla* and *R. gigantea* with which I am working, as well as a host of others – *R. laevigata, R. bracteata, R. longicuspis, R. cymosa, R. sempervirens, R. banksia* etc will have to be used in this hybridizing programme.

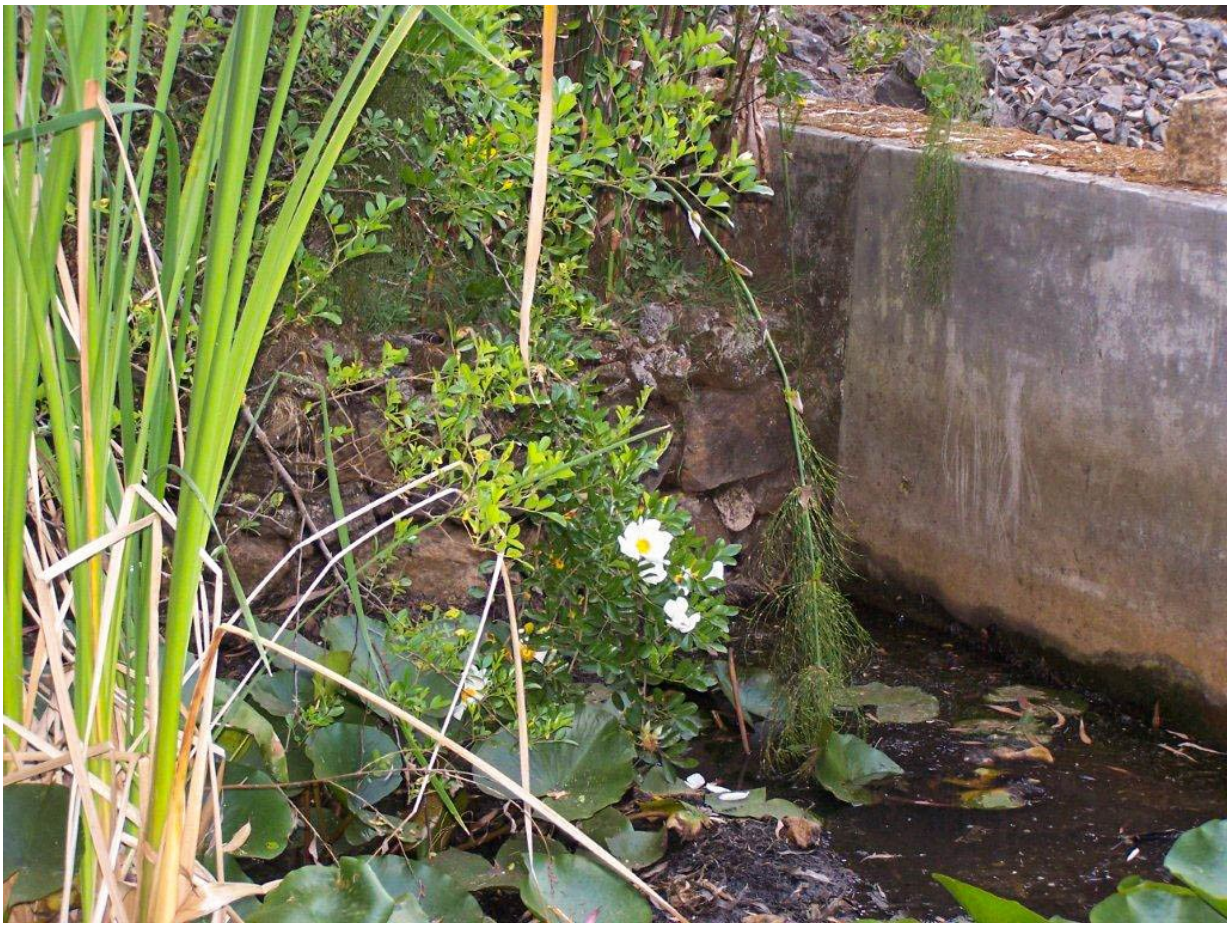
As I said, I am working with two Indian rose species – *R. clinophylla* and *R. gigantea.*

R. clinophylla is unique in the rose world - it is the only tropical wild rose. It exists in 3 forms, all of which have the astounding characteristic of being semi aquatic. Like a dream come true, the 3 forms cover every kind of warm climate.

1. The Bengal form, from eastern India is well adapted to humid warmth. It is found in such improbable habitats like the islands in India's great river, the Ganges, which are submerged under water for nearly 6 months. But *R. clinophylla* survives happily enough.
2. The 2nd form comes from stream margins in the dry hills of Bihar State, to the west of Bengal. Summer temperatures reach 45 degrees Centigrade and remain like that from mid May to July every year. But the species is well adapted to such heat and drought.
3. The 3rd form comes from a mountain, called Mount Abu in the Thar Desert in Western India near the border with Pakistan.Though at 1200 metres elevation and therefore not so hot, it can get very dry as only a desert can. In winter there are sharp frosts with day temperatures at 25 degrees Centigrade.



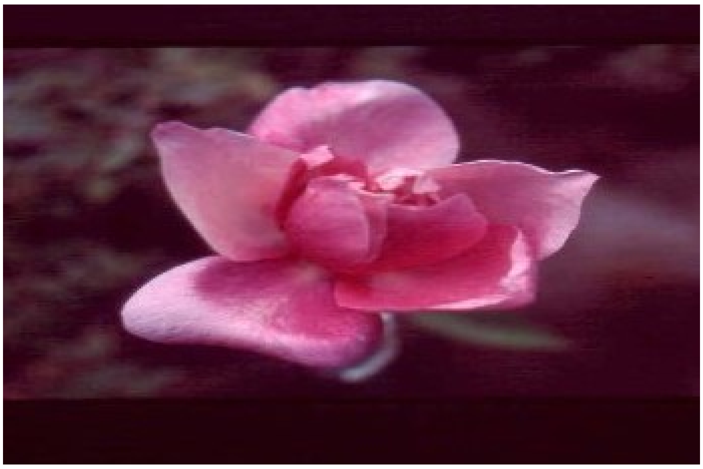
Rosa clinophylla



Rosa clinophylla by poolside

This must be a special rose adapted to a wide range of hot climates. Apart from resistance to water logging, a common problem in warm wet climates the species has beautiful glossy evergreen foliage and flowers with a very intriguing scent. Breeding with this species, which is closely related to *R. bracteata* initially proved very difficult. But finally, roses of 'modern' appearance have been raised.

Ralph Moore has raised some miniatures with *R. bracteata*, and I am endeavouring to bring in these into my *clinophylla* line - a very exciting prospect.



I show you now slides of some of my *clinophylla* hybrids.

'Pink Pink'

'Kamlendumati Shah'

'Ganges Nymp'

Coming to *R. gigantea,* that "Empress of wild roses' as aptly described by Graham Thomas, it is a giant, not only in the flower – 15cms. across, but in its growth. It can reach up to 25metres. I have many plants clambering up my very tall pines. It also has the unique feature of flowering in peak winter. Hybrids with this which should flower in winter will be a big help for the cut-flower growers in warm climates who would be able to cater for Christmas and St Valentine's celebrations.

Fortunately *gigantea* is easier to work with, because its genes are to be found in the background of modern roses. The high centered form of Hybrid Teas is a direct inheritance from *R. gigantea* as is evident even in first generation hybrids. This apart, to quote Jack Harkness, 'as these roses embody 6 great virtues – health, beauty, vigor, scent, good foliage and remontancy, further direct use seems worthwhile'.

Rosa gigantea on our roof

Rosa gigantea

I show you slides of some of my *gigantea* hybrids.

'Lady Jane Hooker'

'Manipur Magic'

'New Blush'

'Out of India'

In conclusion I would like to stress again the need for an original approach. The world is getting warmer and drier. Our roses will need to adapt to such conditions, as also to being part of smaller gardens or of container gardens.

Many of my seedlings in both lines are big sprawling semi climbers. Transforming them into more manageable, free flowering and branching shrub roses, is the next task. Ralph Moore has once again provided part of the answer by stressing the intercrossing of his miniatures, which are free branching and easily propagated by cuttings, with garden roses in order to get shrubs.

I have been toying with another exciting dream - to have ‘rose trees’, which will be big enough to fend for themselves in summer heat and drought. Is this possible? You would agree that it is not so far fetched an idea when one breeds with the ‘chestnut rose’- *R. roxburghii*. Martyn Rix and Roger Phillips have observed that this species forms 5 metres tall giant shrubs, and grows in warm conditions in southern China, on the boundaries of rice fields. The Japanese rose researcher Dr Yuki Mikanagi has noted that the Japanese form of this species forms rose trees 5-6 metres high. Hybrids of *R. roxburghii (R. x micrugosa),* a cross with *R. rugosa*, and ‘Roxanne’ a hybrid with *R. sinowilsonii*, are sizeable shrubs. *Roxburghii* is well adapted to growing in regions where winters are warm but with sudden cold spells.

Breeding with *R. roxburghii*, which has a naturally shrubby, densely branching habit, appears to be very promising indeed, to create rose trees of the future.

ROSES IN JAPAN

For the 50th Anniversary of Pune Rose Society
A Souvenir, sent July 2012

Girija and M.S. Viraraghavan

It was the opportunity of a lifetime for us to attend the International Heritage Rose Conference held by the Rose Culture Institute, Japan, under the aegis of the World Federation of Rose Societies, in Sakura, from 28th May to 6th June 2012. We thoroughly enjoyed this trip, in the company of beautiful roses, gardens, and our rose friends, old and new – all set off by the careful planning and remarkable attention to every detail of the convention by the organizers.

The conference itself was held at the Kusabue-no-aka Rose Garden, Sakura, a few kilometres north of Tokyo. This garden, which boasts of extensive plantings of the roses of the late Seizo Suzuki, Japan's premier rose breeder, has an amazing collection of other roses, including species, climbers, ramblers, heritage roses, including rare introductions from the ancient roses of China. The artistically constructed arches, pergolas, summer-houses and other structures, all made by volunteers, and all covered with climbing roses, added greatly to the impact of the garden. Having been associated with this garden from the beginning, we were delighted to see a separate planting of some of our hybrids, called The Dream of India garden.

An international gallery of rose experts presented talks on many aspects - species, breeding, history, old books, fragrance …. From countries as diverse as Hungary, Belgium, Italy, Scotland as well as Australia, U.S.A., China and India. The exhibition of flower arrangements were delicate, aesthetic and a wondrous feast for the eyes

The pre-and post conference garden tours were organized to show delegates two of the most interesting rose species of Japan, in the wild - *Rosa multiflora adenochaeta*, with its profusion of white edged pink flowers, and the rare *Rosa hirtula*, perhaps the only rose which grows to tree form, with pale lilac pink blooms.

During the course of these tours we had a chance to see some beautiful rose gardens. The colorful Keisei Nursery and Display Garden, near Tokyo, the beautifully landscaped sloping gardens at Akoa on the coast, as well as the Kawagochiko Musical Forest Museum rose garden, with roses displayed to perfection amidst artistic water features.

The tour to locate *R. hirtula* in the wild passes through the mountains of Hakone, from where we had a splendid clear view of the spectacular Mt. Fujiyama. We also saw plants of *R. nipponense* and *R. wichurana.*

We were privileged to see the great Buddha statue at Kamakura, and that marvel of Japanese engineering, the undersea passage through Tokyo Bay.

After the convention many of the delegates visited the Jindai Botanical Garden, Tokyo, (which has just celebrated its 50th anniversary) featuring lovely displays of roses, ranging from species to climbers and with vast displays of modern roses. These gardens are also the location for the International Rose Trials of the Japan Rose Society.

The conference succeeded admirably in sensitizing rose lovers to the beauty of heritage roses and the tours were a revelation on the care and respect with which various aspects of Japanese heritage were revered and safeguarded.

Breeding Roses for Warm Climates and the Role of Some Indian Rose Species

VIRU VIRARAGHAVAN

Warm-climate rose-breeding has been the focus of my work for nearly 50 years now. It is an appropriate stage to record (with gratitude) the inspirational thoughts of the great rose men who have contributed so much to this program—something rather new in a rose world dominated by rose-breeding for temperate climates.

Four major ideas form the basis of my work.

First is the thought-provoking observation by India's pioneer rose breeder B. S. Bhatcharji (1901–1972), who stressed the need to have a separate line of breeding for warm climates.

The famed German hybridizer Wilhelm Kordes II (1891–1976) provided more clarity with his observation about the soup ladle bringing up only what is in the tureen, stressing the need for new genetic input if something original has to be involved. This is an observation doubly relevant when initiating work which implies a conscious reversal of temperate climate rose-breeding with its natural emphasis on cold hardiness.

Further clarity was provided by E. F. Allen (active 1970s and 1980s), the Royal National Rose Society's science adviser, in his 1976 presentation at the International Rose Conference in England, when he observed that the tropical rose species,

FAR LEFT TOP: *Rosa clinophylla* (photo by Robert Riptoe sp?)

FAR LEFT BOTTOM: *Rosa clinophylla* × *R. gigantea (photos by Viru Viraraghavan)*

LEFT: *R.* × *hardii,* hybrid of *R. persica* and *R. clinophylla* from *The Genus Roses* by Ellen Willmott, illustrations by Alfred Parsons, London, 1914

TOP: *R. gigantea* (photo by Doug Seidel)

Rosa clinophylla, could be the starting point for evolving heat-tolerant roses. Allen suggested the use of the Noisette, 'Lamarque', which does well in warmth, as the other parent of the new line, apart from *R. clinophylla.*

And the great pioneer of the heritage rose movement, Graham Thomas (1909–2003), provided the last piece of the jigsaw with his observation that if new Noisette roses (and, of course, their close relatives, the Teas and Chinas, which are the backbone of warm-climate rose gardens) could be created with more vibrant colors, they would take the rose world by storm. And whatever inhibitions were there in starting such a program were dispelled by the welcome support of Dr. B. P. Pal (1906–1989), doyen of modern Indian rose-breeding.

In this background rose-breeding work was started in the 1960s using mainly the Tea roses 'Mrs. B .R. Cant' and 'Étoile de Lyon'. While there was some initial success, it soon became apparent that the genetic potential of the heritage roses had to be reinforced if the new objectives were to be achieved, and this provided the incentive to search for suitable Indian rose species—first of all, *R. clinophylla*, perhaps the world's only tropical species, and the Indian form of *R. gigantea,* which is one of the glories of the rose world.

R. clinophylla proved surprisingly difficult to locate. Earlier, botanists had observed that the species was widespread in India with representatives of the different forms in our northeastern states, Assam, Bengal, and Bihar, with forms occurring further south in the central Indian state of Madhya Pradesh, the eastern coastal state of Orissa, with a further extension of occurrence to limited areas of the Western and Eastern Ghat Mountains of peninsular India. A less tropical form of the species, *R. lyelli*, was to be found in the lower altitudes of the Himalayas, in India and Nepal, and also, surprisingly, on the highest peak of the Aravalli Mountains of northwest India and the Thar Desert, Mt Abu.

Everywhere the tropical forms of *R. clinophylla* (unlike *R. lyelli*) were to be found in what could be called the flood plains of major rivers, as well as in the swampy shores of some freshwater lakes, mainly in eastern India.

Without going into much more detail, it is essential to emphasize that *R. clinophylla* is wonderfully adapted to life in marshy areas—in fact, in the flood plains of the River Ganges, where there is a major occurrence, the rose is submerged in water for several months in the year with only the tips of the branches showing above the water. Indeed, it was thus first discovered by the appropriately named Mr. Rose, an English Superintendent of Post Offices, who, while traveling by boat in Bengal on work, since it was the flood season, saw it rising out of the water.

As the search for *R. clinophylla* continued, it soon became apparent that finding the plant in the wild would be very difficult. Even in the early years, field botanists had observed that this species had the curious habit of occurring in a local area, but not the adjacent similar climate areas, while reappearing at quite distant places. With the extension of agriculture to vast new areas, the habitat has been gravely threatened.

As often happens, the first success came about in a totally unexpected manner. My friend Narender Singh, a keen rosarian of Bihar who was on a hunting expedition, had camped in a forest near a stream in the Chota Nagpur Plateau (Bihar State). While exploring early in the morning, he noticed a rose at the water's edge and guessed that this could be what we were searching for. He sent me cuttings and—sure

TOP LEFT: *R. moschata* (photo by Doug Seidel)

TOP RIGHT: 'Lamarque' by Choix

CENTER RIGHT: 'Mrs. B.R. Cant' (photo by Bill Grant)

RIGHT: 'Etoile de Lyon' (photo by Doug Seidel)

enough—it proved to be one of the forms of *R. clinophylla*.

A second kind reached me in an even more circuitous fashion. Dr. Sivaprasad Bannerjee of Kolkata, a well-known horticulturist, had collected a plant of the species from the banks of the River Padma, which branches from the River Ganges and flows through Bangladesh. This was in the early 1980s. His small garden contained only

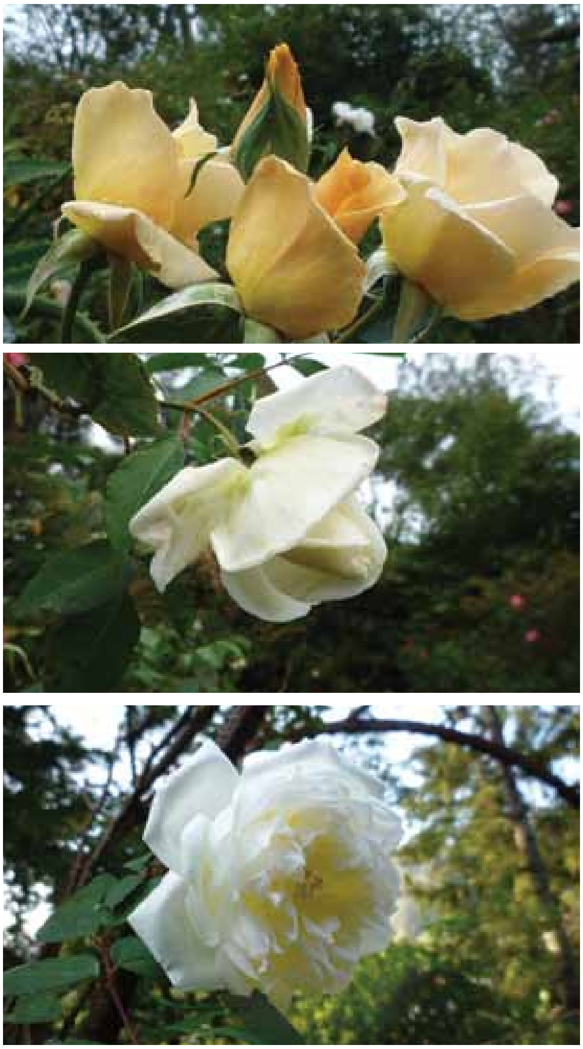
LEFT: 'Little Darling' (photo by Ron Robertson)
BELOW: 'Rev d'Or' (photo by Doug Seidel)
RIGHT, TOP TO BOTTOM: 'Ganges Mist', 'Manipur Magic', 'Rebecca's Choice', 'Naga Belle' (photos by Viru Virararghavan)

one plant, from which an offset was secured by Dr. N. C. Sen, an enthusiastic rosarian friend, who much later sent me a plant.

Having secured the two most tropical forms of the species, my wife Girija and I decided to try to locate the subtropical form, *R. lyelli*, on Mt. Abu. Mt. Abu is a peak rising to 1,700 m (more than 5,000 ft) elevation in the middle of the Thar Desert, Rajasthan State, western India. The only reference we could find about this species was its discovery by Mr. G. King in 1888, with no more details. We started looking for likely places by the side of streams but with no luck. Everywhere the Forest Department had planted *R. multiflora*, which added to the confusion.

After many fruitless days, we were returning disconsolately to our guest house, when the idea suddenly occurred to us to stop a farmer on his way home, and ask him if he knew of such a rose. To our surprise, he said, “yes.” Going with him in our jeep a short distance away, and then making a walk across fields, we found, to our delight, hundreds of this rose planted as field boundaries, next to a lake. More scattered plants could be seen nearer the water, and one had flowers in corymbs rather than in the solitary fashion of *R. clinophylla* itself. We recalled the great Belgian taxonomist M. Francois Crépin (1830–1903) considered that *R. lyelli* was a hybrid of *R. clinophylla* with *R. moschata*. Thus ended our search for the third form of *R. clinophylla*.

Searching for *R. gigantea* in 1990 led us to an entirely different part of the country—Manipur State, which borders Myanmar. An unexpected piece of luck was running into a scientist on the steps of the Botanical Survey of India office in Kolkata (formerly, Calcutta) who had botanized in the area. He gave us the valuable tip that *R. gigantea* could be found on the lower slopes of Mt. Sirohi at about 6,000 ft (Mt. Sirohi rises to 5,000 m elevation—about 16,000 ft). We reached Ukhrul, the nearest town, and early next morning we motored toward the steep dirt track going up to the peak. Leaving the jeep, we had walked a short



ABOVE, TOP TO BOTTOM: 'Golden Threshold' × 'Easlea's Golden Rambler', 'Telenegana Pink' × 'Mrs. B. R. Cant' × (*R.clinophylla* × *R.gigantea*), 'Rêve d'Or' × *R. leschinautiana*
RIGHT TOP TO BOTTOM: 'Patio Tea', 'Pat Henry', 'Lotus Born' (photos by Viru Virararghavan)

distance, when we came upon what was obviously *R. gigantea* climbing up a tall forest tree. It was peak winter—January—the dew was still frozen on the ground. There were no flowers, but plenty of large hips. Further exploration revealed many more plants, and we returned, deliriously happy at our instant success, and armed with many cuttings and seeds.

Apart from these two species, two species hybrids, made by me, have played an important role in the initiation of my program. The first is *R. clinophylla* crossed into the closely related *R. bracteata* (found in Myanmar and southern China). I have several forms of this cross, which generally exhibit much greater vigor than *R. clinophylla* itself, and, more importantly, produce flowers with much better petal texture, which is essential in a hot climate. *R. gigantea* was also crossed with *R. clinophylla* to produce a fair number of hybrids, one of which at least is proving very interesting for further work.

To come to the two lines, *R. clinophylla*-work started with a repeat-flowering seedling, F2, with the parentage of ['Mrs. B. R.Cant' × ('Mrs. B. R. Cant' × *R. clinophylla*)]. Inspired by Ralph Moore, another seedling was raised using his favorite parent, 'Little Darling', crossed with the (*R. clinophylla* × *R. bracteata*) seedling. Progress with this has been much easier than with the pure species.

Many different combinations have been made, incorporating various modern roses such as 'Montezuma', 'Alliance', 'Mme. Charles Sauvage', 'Sunblest', and 'Arthur Bell'. The first releases with this gene mix were the shrub rose 'Silver Dawn' (which has also got the genes of the famous Van Fleet climber, 'Silver Moon'), and 'Ganges Mist', a fully double pillar rose with delightfully cup-shaped blooms. One of the successes of this line is 'Pat Henry', a very elegant shrub rose in pale pink, blessed with great vigor and healthy foliage. A distinctive fragrance is an added bonus, clearly the gift of *R. clinophylla*.

The other line, derived from 'Mrs. B. R. Cant' crossed with the Noisette 'Rêve d'Or' (which does so well in warmth), has produced, surprisingly, a series of dwarf, low-growing, semi-miniature Tea roses. Work on these hybrids and this line, proposed to be called "Patio Teas," is in progress.

Coming to *R. gigantea*, work was much easier as the species figures, though distantly, in the parentage of modern roses. The crucial cross which enabled the breakthrough was the cross done with the French Hybrid Tea, 'Carmosine'.

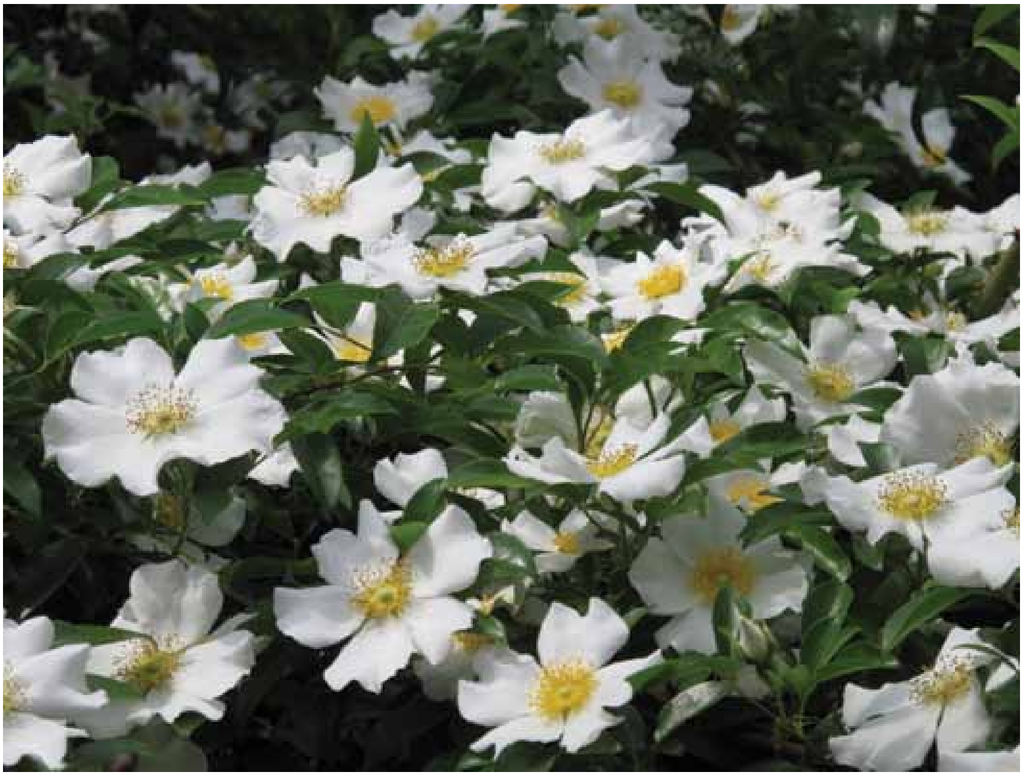
Another crucial cross was (*R. gigantea* × 'Rêve d'Or').

The 'Carmosine' cross resulted in three exquisite climbing roses with beautiful Hybrid Tea form flowers, codenamed "Cargiant 1," "Cargiant 2," and "Cargiant 3." The first is very pollen fertile and has given me many interesting seedlings. The second, with striking flowers in shades of cream, yellow, and pink, has been released as 'Frank Kingdon-Ward', who had rediscovered *R. gigantea* in Manipur in the 1950s. The third, and perhaps the most beautiful and large-flowered of all, has been released as 'Evergreen Gene', as a tribute to Gene Waering who has done so much to popularize evergreen roses in the United States.

Several varieties have emerged from the cross with 'Rêve d'Or'. The most interesting are 'Manipur Magic', with fully double, Noisette-type flowers in rich cream, like a super-vigorous 'Marechal Niel'; 'Amber Cloud', the golden version of *R. gigantea* species itself, has caught the connoisseurs' eye in several countries; and two climbers named in honor of Sir George Watt (who discovered the species in Manipur in the 1880s) and Sir Henry Collett (who found it in Burma, around the same time).

One of my favorite parents, 'Mrs. B. R. Cant', crossed into *R. gigantea,* has produced a pink, single climber of astounding elegance, registered as 'Rebecca's Choice'.

"Cargiant 1" has yielded several interesting seedlings, of which the most distinctive is 'Naga Belle', which has perfect Hybrid Tea form flowers of rich pink on



R. laevigata (photo by Fred Myers)

a vigorous bush with healthy foliage. This recurrent-flowering variety has done well in many different climates.

Another interesting result is 'Golden Threshold' with lovely single flowers of darkest yellow and beautiful contrasting coppery-brown anthers. A further development is a repeat-flowering single, in the same mould, from the cross of 'Golden Threshold' with 'Easlea's Golden Rambler'. This is more a shrub rose than a climber.

Using the hybrid with *R. clinophylla*, crossed into the found China rose "Telengana Pink" (study name), has resulted in an elegant Hybrid Tea form short climber. Further work with this is in progress.

In conclusion a word on work with *R. leschenaultiana*, a Musk rose endemic to my area, the Palni Hills of southern India (and adjoining mountains). A cross, again with 'Rêve d'Or', has resulted in a white, fully-double rose of the 'Lamarque' persuasion. Work with this is going on as also with hybrids derived from *R. laevigata*, especially *R. laevigata rosea,* which is a pink version of the species (or perhaps a species hybrid, opinions differ) from Japan.

The ultimate aim is to raise a new family of warm-climate roses with attractive evergreen foliage, capable of competing with lush tropical plants. ■

A Quest for Gold

Article for the New Zealand Heritage Rose Association journal, 2014

Viru Viraraghavan

It all began in the beautiful surroundings of Sim’s Park, a botanical garden located at an altitude of 2000 metres, in Coonoor, a hill station on the Nilgiri Mountains of South India. The garden enjoys a lovely equable climate, not too different from New Zealand’s North Island. When I first visited Sim’s Park, in the early 1950’s, it had an amazing collection of the Pernet roses, ranging from 'Julien Potin' to 'Condesa de Sástago', and so many others, all grown to perfection. Of these, 'Julien Potin', in richest yellow, was the star of the show – no problem with the pale colours with which it is troubled in less temperate climes. I fell in love with roses then and particularly with golden ones.

My career in Government service meant that it took a while for me to start growing roses again. Inspired by the need to create better roses for India’s warm climate, crosses were made with the Tea roses and with modern yellow roses, especially with one of the first unfading yellow roses, 'All Gold' (Le Grice). Beginner’s luck led to a striking yellow, half Tea, but sadly a transfer to an impossible climate spelt doom for this rose.

Some years later, our rose federation held a convention in the lake city of Bhopal in central India. In the garden of a Nawab (minor royalty) grew rather appropriately, an extraordinary bush of 'Royal Gold', in an unbelievably intense colour. By now my rose breeding had gathered momentum and a combination of 'Royal Gold' and 'Madame Charles Sauvage', a lovely Hybrid Tea from the house of Meilland, led to 'Ahimsa' (aka 'Orient Silk'), pure yellow and absolutely free of prickles. It was this latter feature that led to my naming the rose 'Ahimsa', which, as you may know, refers to Mahatma Gandhi’s philosophy of non-violence.

But 'Julien Potin' was not forgotten. A cross with the then favourite of exhibitors, 'First Prize', led to the wheaten brown and copper 'Nefertiti' - my youthful imagination conjured up an image of that fascinating Egyptian princess, skin glowing in such colours.

Warm climate rose breeding had by this time become centre stage in my efforts and work started with *R. gigantea,* which we collected from India’s north eastern region .*R. gigantea* was described by Sir George Watt, who discovered the species in 1882, as climbing forest trees and blooming above the tree tops, looking like golden magnolias from afar. As can be imagined, this description led me to use *R. gigantea* in my breeding for yellow roses.

Among the many seedlings raised from seed from our expedition came one which at bud stage looked almost like 'Lady Hillingdon'. This plant became the basis of the new line, with the other parent being the Noisette, 'Rêve d’Or', which does very well in India.

A spectacular result was the giant climber, 'Amber Cloud', which (much to my delight) has now spread from Florida (USA) to Sardinia (Italy), and from Sintra (Portugal) to Japan.

A further intensification of gold occurred with 'Golden Threshold', a combination of a vermillion brown Hybrid Gigantea seedling, and 'Golden Showers'. The single flowers of 'Golden Threshold' have an unbelievable intensity of colour, set off admirably by the wine red and brown anthers like eyelashes on a pretty face.

'Golden Threshold' led to further intensification of colour, as had happened with the original Pernet roses, to produce my latest seedling, in coppery saffron gold.

And so the quest continues….. a golden rose may not be gold in any material sense, but it is undoubtedly gold for the soul.

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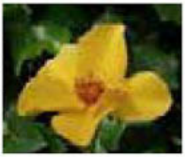


And so the quest continues… a golden rose may not be gold in any material sense, but it is undoubtedly gold for the soul. ~ **Viru Viraraghavan**

When it comes to roses I am a romantic, which is why I love old roses. I prefer whites and pinks—French and 19th century, which is what I have now. And I love Italian gardens !! Which is what we sort of have now. DEREK ROBISON

IN THE FOOTSTEPS OF THE MASTER

The Conference at Mottisfont Abbey Rose Garden, England, 23-25th June 2014

Article about the conference for the

New Zealand Heritage Rose Association Journal

M.S.Viraraghavan

'If there is a Paradise on Earth, it is this, it is this, it is this'

- Inscription at the entrance to the Shalimar Garden, Kashmir, India -

Created by Mughal Emperor Jahangir for his wife, Nur Jahan.

Rose lovers around the world would undoubtedly feel that this inscription applies most appropriately to the walled garden created by Graham Stuart Thomas in Mottisfont Abbey, a National Trust, U. K. property. The Trust, with justifiable pride, says that Mottisfont is 'a garden of international importance and reputation'. It remains the most complete and compelling statement of Graham Thomas' planting philosophy and gardening genius.

A great garden is a work of art, but it is not static. It requires inspired and dedicated development over the years. And this is the contribution of David Stone, Head Gardener. The conference was organized under the ebullient leadership of Stephen Scanniello (whose light-hearted manner covers formidable organizational skills) President, Heritage Rose Foundation, USA (but with members throughout the world), to honour David Stone on the eve of his retirement and to recognize his extraordinary contribution to this garden for nearly 40 years.

The first day of the conference, 23rd June, began with registration of participants and a series of lectures, designed to whet the appetite for the tour of the garden itself on the next day.

A sparkling introduction by Stephen was followed by a fascinating presentation by David in which he recounted his days with Graham Thomas. His humorous account of his encounters with the great man captivated us. David has a great ability to evoke the romance of Mottisfont, the lovely combinations of heritage roses with other plants, as well as the beauty of the garden in various seasons, even in the depths of winter. I can do no better than to quote from what he has written, to evoke the spirit of his lecture - ‘a garden at dusk (and at other times) is a place of wonder in which the passage of time seems suspended, each moment holding an expectation of eternity’.

The next talk, “A Hampshire Garden” by John Woods, Head Gardener of the National Trust garden of Himpton Ampner, presented an interesting account of the transformation of a marshy expanse of wilderness into a garden of great beauty and originality. John is a young man who will, undoubtedly, in the fullness of time, join the ranks of the great gardeners of England.

The third lecture by garden landscaper, Maurizio Usai, “Designing with Roses”, had us spell-bound with his narration of how he had transformed the rugged, sometimes fearsome landscapes of his Mediterranean island of Sardinia into unexpected beauty. Illustrating his design philosophy with many photographs, he showed the transformation he had achieved in his father’s olive grove with his personal garden, called La Pietra Rossa, which was indeed incredible.

The next talk was by Jonny Bass, incoming Head Gardener, Mottisfont. Jonny, while clearly aware of both the responsibility and the excitement of succeeding David, was unfazed by the challenges of the future, and the audience felt that here indeed was a worthy successor.

The last lecture was a masterly presentation by Peter Boyd on the history and beauty of the spinosissima roses, with an emphasis on his eagerly awaited new book on this class.

In between the lectures there were three short presentations. Malcolm Manners, professor at Florida Southern College, who represents a most remarkable combination of science, enthusiasm and inspiration, gave an account of his project, the DNA analysis of the roses, ‘Maggie’ (USA), ‘Kakinada Red’ (India), ‘Pacific’ (Bermuda) with the Geschwind rose ‘Eugene E.Marlitt’. His results show that the first 3 roses are identical. Analysis of Eugene E. Marlitt is yet to be done, and we await this final step.

Pamela Temple spoke of creating her most distinctive and beautiful garden in California, with an unusual focus on climbing and rambling roses.

Anita Clevenger, the charismatic custodian of the well known Sacramento Cemetery Heritage Rose Garden, California, talked about this garden where the ghosts of the past are redeemed by the profusion of roses, expertly and lovingly tended by a band of volunteers.

In conclusion, Stephen gave a short account of the remarkable transformation achieved in the neglected areas of New York City by the planting of heritage roses in churches and public areas.

A silent auction of some rare and original rose books and journals was held.

The celebratory banquet set the tone for the rest of the conference; interspersed between the dinner courses were three short presentations. Michael Shoup, of the well known Antique Rose Emporium, Texas, spoke on growing better roses using aerobic compost tea, a refreshing new approach, which would ensure beautiful roses without the hazards of chemical fertilizers.

My presentation, titled 'Stumbling Behind the Master' focused on rose breeding inspired by Graham Thomas' dictum that if the Noisettes (as also Teas and Chinas) could be created again, and given more color, they would take the rose world by storm.

Billy West, one of the six authors of the book on Tea roses, who combines profound knowledge with compelling charm, spoke on the need for conserving heritage roses in all countries, giving examples of the work done in Australia by people like Pat Toolan whose energy and dedication has propelled the heritage rose movement in that country to new heights.

The second day, 24th June, was the eagerly anticipated visit to Mottisfont garden. The participants had been divided into groups and each group was taken on four guided tours – the first three tours were within the walled rose garden, focusing on

1. the roses themselves - climbers, ramblers, shrubs etc
2. the companion plants
3. the philosophy and maintenance procedures of the garden

The 4th tour explored the entire property - the Abbey itself, the sparkling streams with brown trout, the ancient trees which include the largest plane tree in Britain, and the other garden and agricultural areas.

As one hailing from warm climate India, I was delighted to see the Noisette climber, 'Maréchal Niel', in splendid form. As was 'Perle des Jardins' with fully open flowers in sparkling gold (it hardly ever opens in my garden!)

The spectacular pillars of the lilac roses were much in evidence – 'Veilchenblau', 'Rosemarie Viaud', 'Blue Magenta'. Other notable roses were 'Charles de Mills', 'Tuscany', 'Mme Isaac Pereire' and the striped 'Rosa Mundi'. The Portland, 'Amanda Patenotte' with globular pale rose blooms and the Moss rose, 'Henri

Martin' with shining crimson flowers were in good form. Several of the Chinas, like 'Le Vésuve' were looking good though David told us that 'Mutabilis' doesn't do well.

The shy, indeed introverted, charm of 'Raubritter' reflected in the circular pool at the heart of the garden, represents uniquely the compelling attraction of Mottisfont, an oasis of peace in a world of strident colors. It was easy to imagine that the cup-shaped flowers of 'Raubritter' were filled with the nectar of tranquility.

Dazzled as we were by the beauty of the garden, we were not immune to the attraction of fresh scones and clotted cream, and the fascinating Mottisfont Abbey itself with its period furniture and paintings, and a never-before-exhibited display of the flower paintings of the artist Graham Thomas, specially procured from various sources for the conference by David Stone.

25th June, the third day, took us by coach to two spectacular gardens, Hinton Ampner and Loseley Park. At the first garden we saw magnificent beds of roses and other rare plants, but to my mind the crown jewel of this garden was a gigantic specimen of *Rosa sinowilsonii* with its shining, large foliage. At Loseley Park we listened with interest to Mercy Morris on the National Plant Collection programme and the newly installed Plant Guardians scheme, for the conservation of various kinds of plants.

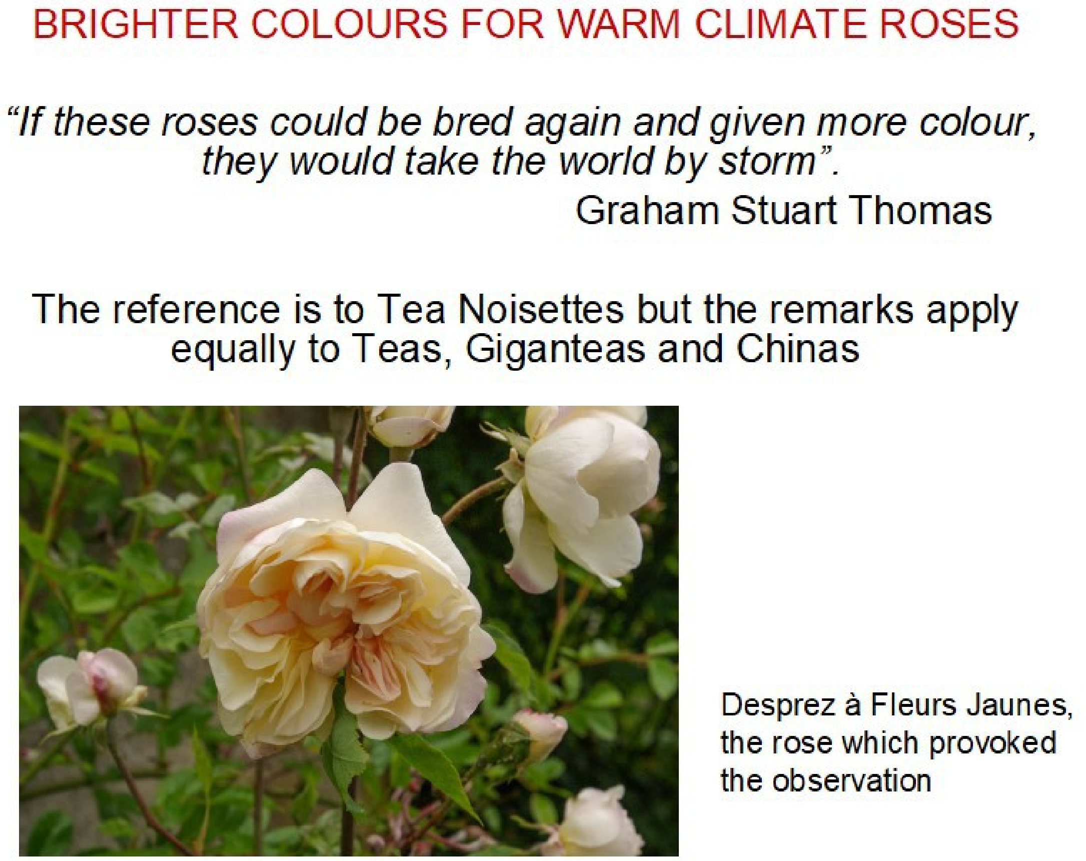
We saw an ancient mulberry bush, reputed to have been planted by Queen Elizabeth I. The White Garden was beautifully landscaped.

Our account of the garden at Mottisfont will be incomplete without mentioning the devoted contribution of chief volunteers Jon Dodson and Joan Taylor to the upkeep of the garden and the success of the conference. Jon's private garden is undoubtedly one of the most beautiful rose gardens we have ever seen, and by all accounts, so is Joan's. Sadly we missed visiting it. But other participants have been raving about their visit to her garden after the conference was over.

STUMBLING BEHIND THE MASTER

Talk at the heritage conference of the Heritage Rose Foundation
in Mottisfont in 2014

Viru Viraraghavan



BRIGHTER COLOURS FOR WARM CLIMATE ROSES

"If these roses could be bred again and given more colour, they would take the world by storm".
Graham Stuart Thomas

The reference is to Tea Noisettes but the remarks apply equally to Teas, Giganteas and Chinas

Desprez à Fleurs Jaunes, the rose which provoked the observation

When I first came to know the theme of this conference I felt that it was singularly appropriate as far as my own line of breeding was concerned. As some of you may be aware, the focus of my rose breeding has been the creation of better roses for warm climates. And there can be little doubt that of the existing kinds of roses, it is primarily the Teas, the Chinas and the Noisettes which are the obvious choices for a rose garden in the tropics. Even in the early stages of my work the observation by Graham Thomas on further breeding with Noisettes (which of course applies equally to Teas and Chinas) that "if these roses could be bred again and given more color, they would take the world by storm" was given great importance *(1)*

> The beautiful pastel shades of the Tea rose group are greatly enhanced by the ability of the petals of these roses to allow light to pass through. The new roses in brighter colours should retain this capacity.

How do we bring brighter colors into the Noisettes, Teas Giganteas and Chinas? Several possibilities are fairly obvious. The first and foremost is the introduction of the genes of *Rosa foetida*, on the logic that it was this step which caused the color explosion in the modern Hybrid Tea. But a timely word of caution from Dr David Leach, an authority on rhododendrons, is worth emphasis. He pointed out that the bright yellow colors of *Rosa foetida* are based on the water insoluble carotenoid pigments which are opaque to light. So, as the carotenoid content of a flower increases beyond a point, it loses the ability to allow light to pass through the petal which is the special feature behind the charming colors of the Tea roses.

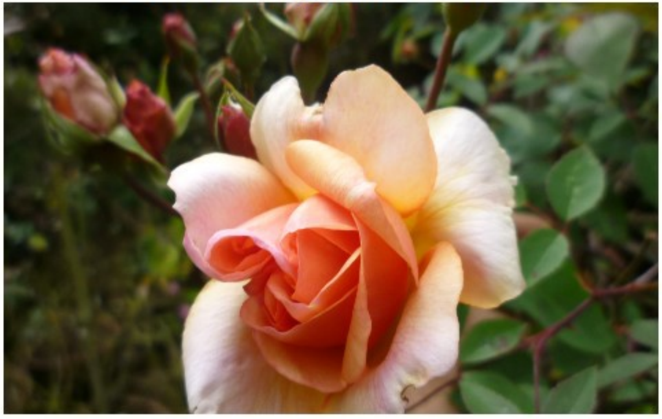
There are three different basic steps possible in this endeavor. They are:

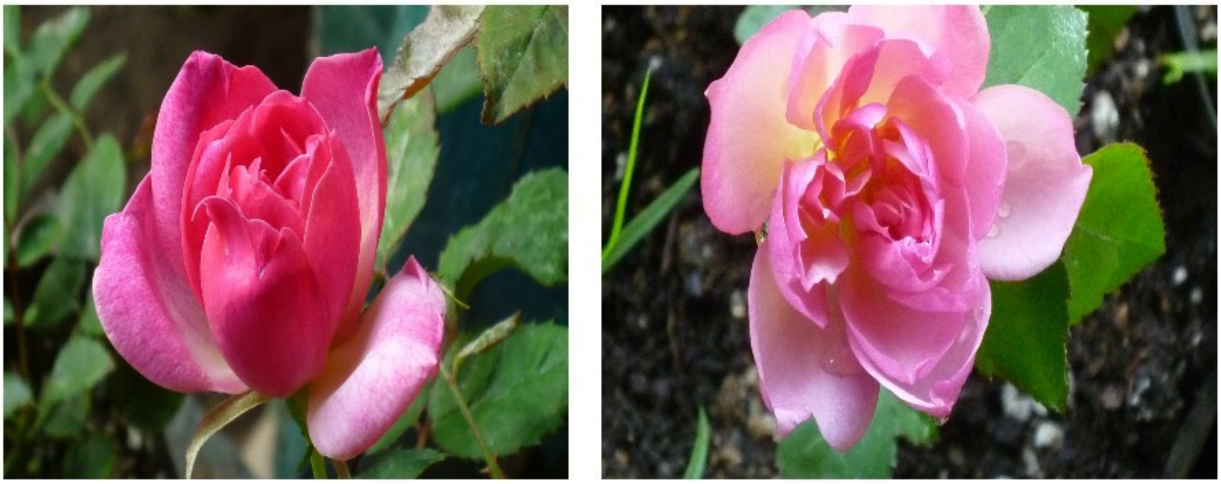
1. The use of the variety 'Fortune’s Double Yellow', which according to Prof. Eugster (2) is the only rose of the Tea/Noisette group with the ability to undertake the early steps in the carotenoid synthesis.

2. The use of modern roses in which the carotenoid is already present, especially some of the very fertile yellow Ralph Moore miniatures like 'Rise ‘n Shine', as well as other dwarf yellows. Yellow H.T.s I felt should not be used as they would increase the size of the flowers beyond acceptable Tea rose norms. This of course does not apply to hybrid giganteas.

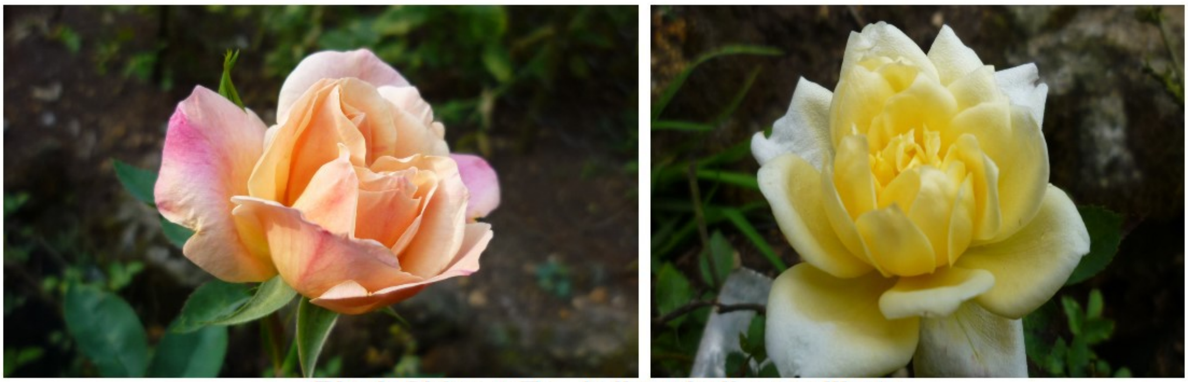
3. It is a somewhat surprising fact there are some Tea roses which are the result of crossing standard Teas with *Rosa foetida*. These could be used. One of the few still available in this group is 'Jean André'.

One of the few Foetida Teas, Jean André, which can be used to create brighter colors

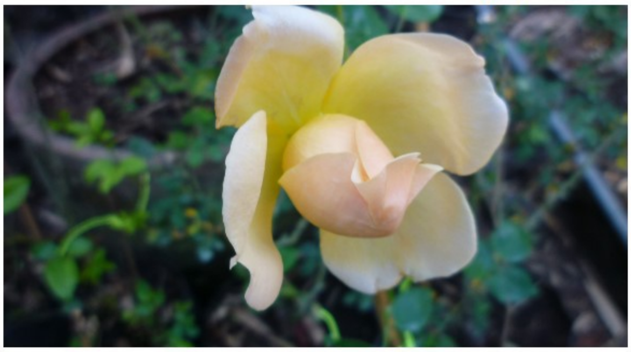




The first step has produced pinks with yellow base in crosses with Tea derivatives



Rise'nShine x Tea / clinophylla seedlings



Baby Love x Tea / gigantea seedling

The photographs on the screen illustrate the progress so far made on utilizing possibilities 2 and 3

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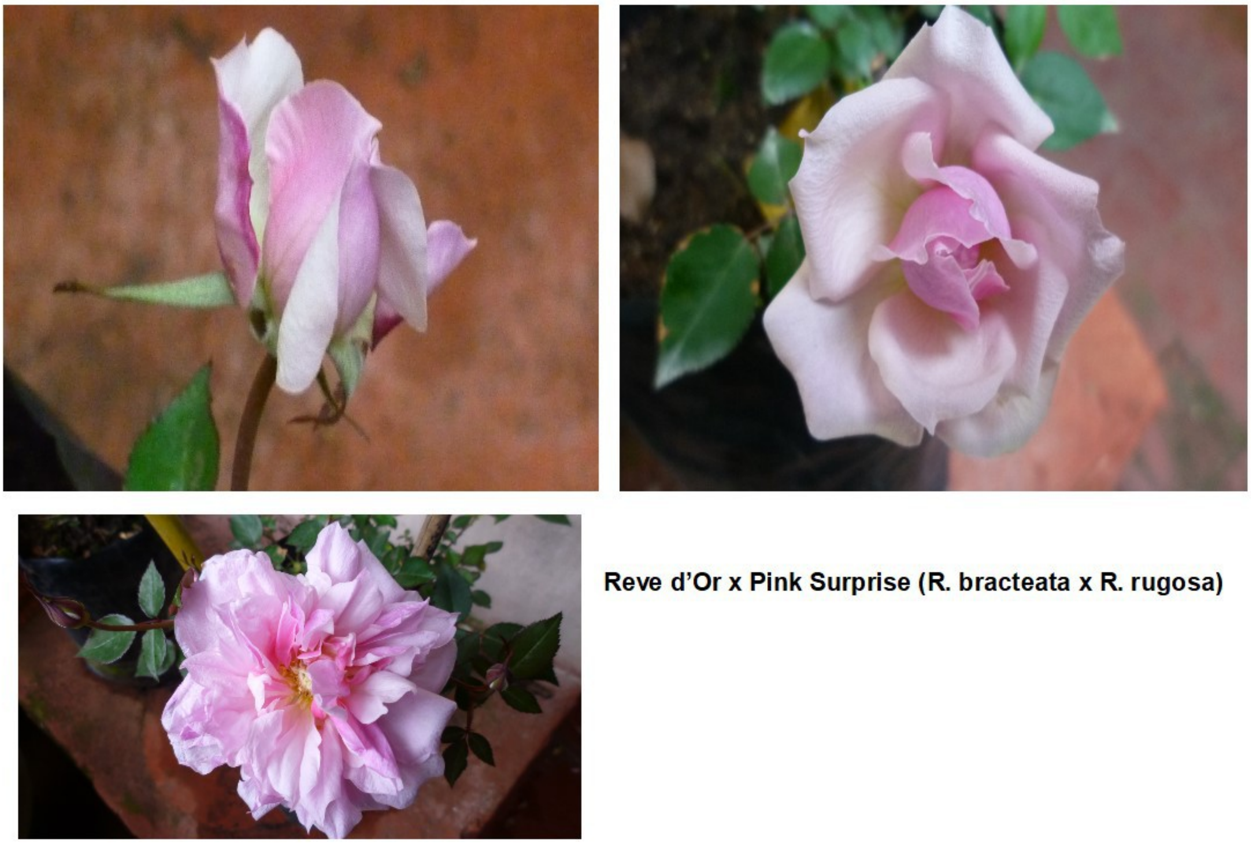
As regards 'Fortune’s Double Yellow', several seedlings have been raised but the first generation are all disconcertingly pink so now a second generation is being raised.

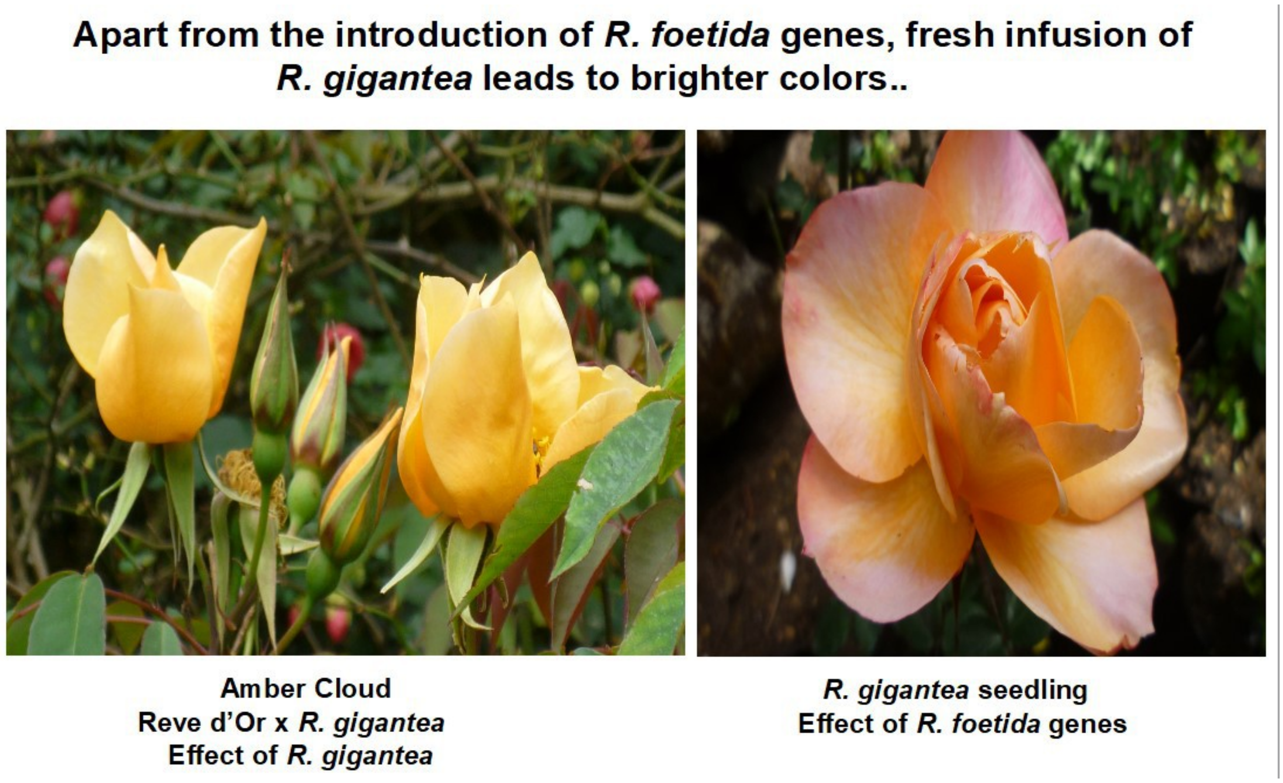
The golden shades apart, we have to consider what can be done to create Tea etc roses in shades of lilac and purple as also in the orange colors. Some progress has been made using the Rugosa/bracteata Lens hybrid, 'Pink Surprise', crossed into 'Rêve d’Or'.

Lilac colours in Teas



Reve d’Or x Pink Surprise (R. bracteata x R. rugosa)

My work from the beginning has included the polyantha 'Echo' in a search for freedom of flowering in the new strains. But 'Echo' is also the forerunner of the Koster strain of bright colored polyanthas which are mutations from 'Echo'. So far, such a mutation has not occurred with my new roses, bringing in orange colors based on pelargonidin which lie at the basis of the Koster series. I must also confess that I am somewhat put off by the prospect of the howls of protest which are likely to greet Tea roses in shades of 'Orange Triumph' and its successors.



Apart from the introduction of *R. foetida* genes, fresh infusion of *R. gigantea* leads to brighter colors..

Amber Cloud
Reve d'Or x *R. gigantea*
Effect of *R. gigantea*

***R. gigantea* seedling**
Effect of *R. foetida* genes

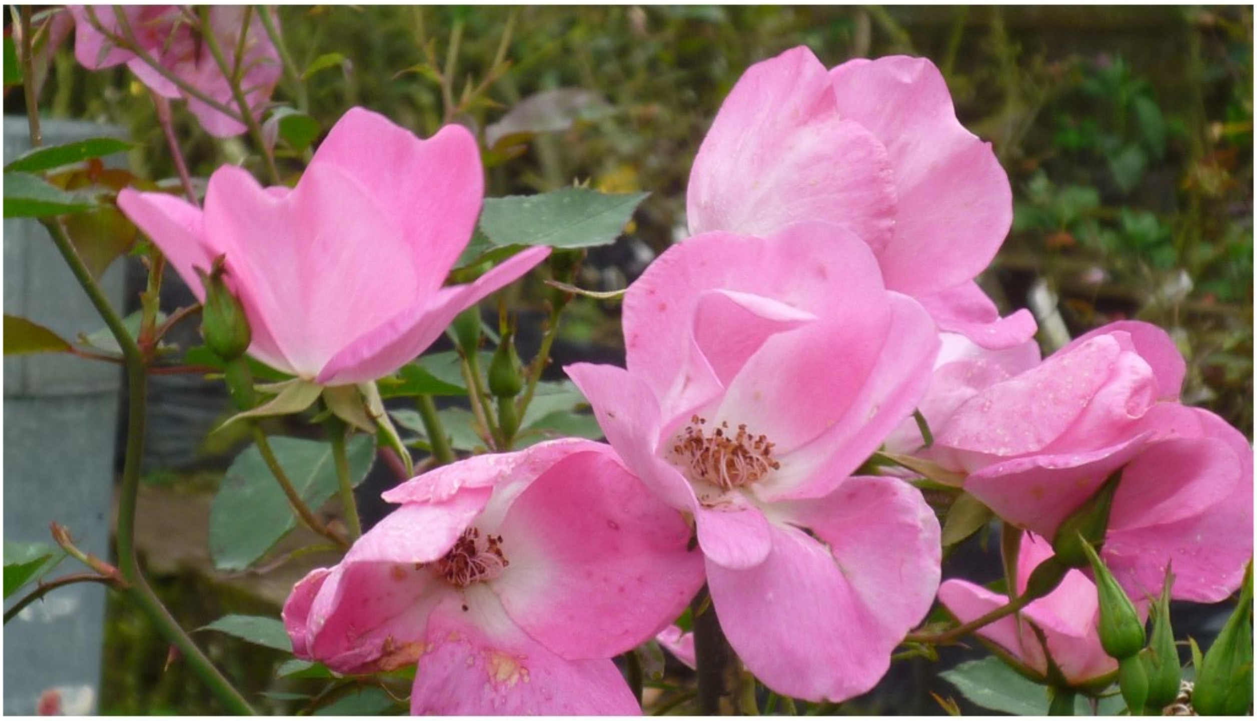
'Amber Cloud' and 'Brahma Vishnu'

The genetic potential of the Tea rose line has perhaps been already fully exploited. So many hundreds of these classes have been raised and lost in the past. It is therefore necessary to bring in fresh blood and my new strains bring in the genes of *Rosa clinophylla*, perhaps the world's only tropical rose species, and of *Rosa gigantea*. The latter is for the reason that increasing the *gigantea* content of Tea roses seems to lead to better yellow shades. Indeed, *Rosa gigantea* is present in the old Tea roses, but somewhat distantly.

Another interesting possibility towards enlarging the genetic mix behind the new roses is to bring in *Rosa laevigata*. The first step has been taken with a cross between a seedling of Tea rose extraction selected for heat resistance and Laevigata rosea, a *laevigata* hybrid from Japan.

No signs so far of the predicted storm. Perhaps it is the calm before the storm.

Effect of bringing in *R.laevigata*



A Tea rose derivative X *Laevigata rosea*

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ROSE PRODUCTS FROM INDIA

A lecture cum workshop held at Le Rose Antiche del Montefeltro, Italy, 2004

Girija Viraraghavan

Before I deal with rose products which are typically Indian, I would like to tell you a little bit about the association of roses with India from ancient times. This will give you an idea about the use of roses and the distinctive Indian products made from roses, which have been in existence for a very long time, and are still in use today. Just as you, in Italy, have a long connection of roses in your history, so too, we in India have had roses as a leitmotif in our over 5000 year old history.

Though the lotus is our sacred and national flower, the rose has been a very close second, mentioned in ancient literature, especially in medical texts, which date to pre-Christian times, indeed, about 3000 years ago. The uses of roses for various ailments were well delineated. This was natural, because, from those olden times we have had over 10 species of roses growing wild in our Himalayan mountain ranges (the same Himalayas which were considered to be the abode of our gods), and many of these as well as ancient rose varieties were considered to have specific medicinal properties. In fact, the rose flower was called by innumerable names in the language of those days – Sanskrit – and each name described a particular characteristic, or ability to cure a particular illness.

Trade and communication between India and the Middle Eastern countries and with China, by sea and land routes, were in existence in the centuries before Christ. And one of the articles of commerce was rose water. A sage named Nagarjuna, who propagated the teachings of the Buddha, is said to have discovered the making of rose water, and he has given details in the books he has written. Around the same time Ibn Senna (Avicenna) of Arabia also described the process.

Alexander the Great, who invaded India in 327 B.C. is reported to have sent back a rose plant among many other plants which he saw for the first time, to his tutor and mentor, Aristotle.

On a stone lintel over a gateway in the San Thome Cathedral in Madras, in Tamil Nadu State in southern India, where the apostle, St Thomas died in 40 A.D., and where he was buried till his remains were taken to Edessa in Syria, there is an intriguing design sculpted of 8-petalled roses. This was in about 40 A.D. – and your town of Urbino was founded in 41 A.D. by the Romans!!!

Two Portugese travellers to the court of one of India’s greatest kings of medieval times, Krishna Deva Raya of the Vijayanagar Dynasty, also in south India, mention, “roses are sold everywhere. These people could not live without roses and they look upon these as quite as necessary as food”. The King would, everyday, sprinkle white roses on those courtiers and animals - elephants and horses - that he favoured on that day.

The advent of the Mughal rulers in India from Persia, (now Iran) denoted a new high for roses in India. They loved roses to distraction and their gardens – the famous Mughal style gardens like the Shalimar Garden of Kashmir, are well known to this day. They used roses in various forms, apart from as plants, in their gardens, and this predilection for rose products continues in present day India.

Apart from fragrant potpourris and perfumes as in the West, in India we also use roses in typical medicinal, dietary and cosmetic formulations.

In many parts of northern and western India, for instance like the town of Pushkar in Rajasthan State (Western India), and in Uttar Pradesh State (northern central India), where the soil is rich and water abundant, *R. damascena* and 'Rose Edward' (believed to be the first Bourbon rose) are grown in fields on a commercial scale. From their distilled petals, rose water and rose oil are extracted. A more recent heritage rose, 'Gruss an Teplitz' (Geschwind, 1897) is also grown for this purpose.

Rose water is used as a coolant, medicinally in eye drops, and cosmetically in lotions and skin moisturizers. Rose water has been mentioned in ancient texts on Ayurveda, the Indian system of medicine, which is based totally on herbs and plant extracts. These Ayurveda texts authored by physicians and surgeons of those days, date back to the 1st century A.D, though they were compilations of the system which had been in existence for many centuries before.

Rose water is also used as a food flavouring, especially in typical Indian sweets. Children are given rose flavoured milk to drink .

Rose water is an essential part of all festivities, where it is used as a fragrant welcome spray. For example, in traditional Indian weddings, guests are welcomed at the entry to the venue of the wedding - whether it is a temple, a wedding hall, a five star hotel reception room, or even a specially erected marquee - by young girls, who will give the women guests a few flowers - roses and jasmine - to put in their hair, small dabs of turmeric powder, sandalwood paste, and a red powder called ‘kum kum’, and on both women and men guests, a sprinkling of rose water dispensed from a special showerhead tipped silver flask. Each of these items, the giving of which are typical gestures of traditional hospitality and welcome, have an auspicious symbolic value.

The bride and groom at an Indian wedding will be bedecked with garlands made of roses and roses will be a prominent part of the decoration of the marriage place.

Indeed**, rose garlands** are used for a variety of occasions, be they joyous or sorrowful – in temples for worship, at funerals, at any festive occasion, be it religious or social, and even in governmental and political functions, the VIP's will be garlanded with rose garlands. So, an important shop in the market place will be the one selling garlands. The roses used for garlands are again *R. damascena,* 'Rose Edward' and 'Gruss an Teplitz'*.* Over the years, and over many generations of these varieties, slight differences in colour and shape have emerged.

In our worship in temples and in homes, we use incense sticks and incense cones made of rose fragrance. When these are lighted, a beautiful rose fragrance permeates the air.

Rose attar (or 'otto' which is the Westernised word) is another name for rose oil, also called 'ruh gulab' in India, 'gul' being the Persian word for rose. Ruh gulab is considered precious – about 10gms of it can cost as much as its equivalent weight in gold. Three to four thousand kilograms of rose petals are required to obtain just one kilogram of rose oil. This 'attar' (or 'itr'as it is called in Persian) is made by steam distillation of rose flowers plucked very early in the morning. The first product in the distillation process is rose water, and from this, over a period of days of further distillation, minute quantities of rose oil are collected.

The Mughal Empress, Nur Jehan, wife of Emperor Jehangir, (in the17th century) celebrated for her beauty and intelligence, is credited with discovering rose attar. Actually it was her mother who discovered this. When she was taking a royal bath in hot scented rose water, she saw a scum forming, which had a concentrated rose fragrance. She collected this scum, and according to Emperor Jehangir 'it was of such strength in perfume that if one drop was rubbed on the palm of the hand, it scented an entire assemblage, and it appeared as if many rose buds had bloomed all at once. There is no scent of equal excellence. It restores hearts that have gone and brings back withered souls'.

Bulgaria, Morocco, France and India are the major producers of rose oil today. *R. damascena* and *R. x bourboniana* ('Rose Edward') are the varieties generally used in India for rose oil, though in other countries *R. centifolia, R. alba* and *R. gallica* are also used.

Rose oil is used in perfumes, soaps, cosmetic creams, lotions, moisturizers and face packs, for flavouring soft drinks and alcoholic beverages, and also in our system of medicine, Ayurveda.

Tons of rose petals are dried in the shade to make another Indian rose product called **Pankhuri.** This is sent daily by air to the Middle East countries, particularly Saudi Arabia, where it is used in beverages, food and medicine. The dried rose petals are steeped in cold drinks, like milk and lemon juice, since they are said to have a cooling effect on the body, very soothing to drink in the hot summers.

These dried rose petals are also powdered and used in the traditional Muslim system of medicine, called ‘unani’.

They also form part of Indian cuisine – as decoration on pilafs, and various gravy dishes. Traditional Muslim sweets use a lot of this pankhuri.

We – my husband Viru and I – visited the little town of Pushkar in Rajasthan State, in 1999, after attending the W.F.R.S. Regional Rose Convention in Jaipur, the capital of Rajasthan State (where we first made the acquaintance of our very good and dear friend, Helga Brichet). Pushkar is a pilgrimage town for both Hindus and Muslims, and the site of a famous camel fair every year. The air at Pushkar was scented throughout the day with a heady rose fragrance, because of the pankhuri (dried rose petals) making industry there. Rose petals were being dried on every available flat surface – in courtyards, on flat terraced roofs, on play grounds, and sometimes, even on the roads. The petals dry very quickly, without losing too much of their original colour – pink or red. They are carefully packed and sent off to the nearest airport to catch flights to various destinations.

Gulkhand is another Indian rose product**.** It is a preserve made by mixing equal quantities of rose petals (either *R. damascena* or 'Rose Edward') with white sugar. This mixture is kept everyday in the sun, till the two mix together well and coalesce, the sugar melting and coating the petals. It is then bottled. Gulkhand is used as a tonic and as a laxative.

Another rose product is **Gulroghan**, which is a hair oil made by a process of maceration. Rose flowers are spread over washed sesame seeds in alternate layers so that the seeds absorb the perfume. Each day, the exhausted flowers are removed, and replaced by fresh flowers, until the sesame seeds are saturated with the perfume. Then these seeds are crushed in a press to extract the perfumed oil. Both men and women, particularly in North India use this hair oil, as it is said to give a glossy sheen and decrease hair loss. Personally, though I love roses, I must admit that I am a little aghast at the thought of applying such a highly perfumed oil to my hair!!!

Rose essence, rose syrup, rose sherbet, rose wine, rose liquer, rose honey, rose hip jam are some of the forms in which Indian cuisine uses roses. The finest of rose liquers was distilled for emperors and royalty in earlier days. About 20,000 rose flowers were distilled in order to get one bottle of liquer.

Rose hips are valued for their high Vitamin C content. They also contain other vitamins – A, B, K, and folic acid, and they do not lose their efficacy when cooked. We have in the north east of India, in Manipur State, a rose species called *R. gigantea* growing in the wild. The hips of this species are huge, and are sold in produce markets along with fruits and vegetables. We grow a number of plants of ***R. gigantea*** in our garden and I regularly make rose hip jam.

And, as I mentioned earlier, like in the West, **potpourris** and **sachets** for perfuming rooms and linen closets are made in India too.

I would like to end with a description of a particular festival we celebrate called ‘Holi’ in March every year. It heralds the arrival of Spring. It is a gay and colourful festival where traditionally, brightly coloured powders and liquids, red green, blue, yellow, are flung by people on each other. We wear our oldest clothes so it does not matter if they get stained with the colours. But in some parts of the country, instead of colours, they fling fragrant rose flower petals, as also other flower petals, on each other. And I think that’s a charming and happy way of saying that winter is over, Spring has come to gladden our hearts and make all plants sprout and grow.

A BRIEF HISTORY OF THE ROSE IN INDIA

Girija Viraraghavan

- I have researched over many years, about the history of roses in India from ancient times, purely as a hobby and for my own interest -

Updated 10/3/2009

The association of roses with Indian history goes back to the very beginning of time. India has had an unbroken thread of civilization stretching to well over 5000 years. The archaelogical sites of the "Indus Valley Civilization" -- Harappa, Mohenjodaro, Dolavira -- date to around 3000 B.C. and show a very advanced culture consisting of well-planned, geometrical grid-constructed cities with wide streets, brick houses, zoning, water supply, sewage disposal systems, etc. All of these features were carefully coordinated.

However, earliest Indian history is based on oral tradition, not written words. Though many seals written in the Harappan script have been found in the Indus Valley Civilization, they have not all been deciphered so far. The first written books date to around 600 B.C, when the Upanishads and Sutras, Hindu sacred texts, were written. The sacred Vedas, which date to about 2000 B.C., were at first only orally transmitted.

The Hindu view of the past has traditionally been centered on myths, legends and folklore -- an oral tradition and, therefore, subject to some distortion and revision over time. But many elements in legends persist from one account to another - and these form a core of authenticity that reveals India’s long and deep involvement with roses.

One such legend relates that the two Gods, Brahma, the Creator, and Vishnu, the Protector, contended about the flower that was the most beautiful. Brahma favored the lotus and Vishnu the rose. But upon being shown the arbor laden with fragrant roses in Vishnu’s celestial garden, Brahma conceded supremacy to the rose over all other flowers, including the lotus!1)

Another legend comes down to us in two forms. In the first, Vishnu has created his consort, the Goddess Lakshmi, out of the rose. In the second, which is supported by most authorities, Lakshmi is created out of the lotus. As a rosarian, however, I prefer to subscribe to the first! 2)

In the epic Mahabharata, Bhishma Pitamaha, on his deathbed, advised the Pandavas to offer roses, called ‘satapatri’ or ‘sumana’ to Gods and deities as it was the best offering.

While describing the beauty of that ancient beauty, Damayanti, her face was compared to the rose.

The presumption that legends such as these suggest a long and deep involvement in India with the rose is further reinforced by the fact that the abode of the Gods, again according to legend, were the Himalayas, the sweeping chain of snow-capped mountains stretching over 2500 miles from the northwest to the northeast of India, which are, not so coincidentally, home to 15 species of wild roses.

These wild roses of the Himalayas, ordered with overlap from west to east in their range, are *R. foetida, R. ecae, R. beggariana, R. webbiana, R. brunonii, R. eglanteria, R. moschata, R. macrophylla, R. sericea, R. longicuspis, R. laevigata, R. banksii, R. bracteata, R. gigantea* and *R. lyelli*, which grows in the foothills.3) *R. clinophylla*, perhaps the only truly tropical rose species, though more prevalent in the islands of the Ganges River and points south, has also been reported in Nepal (a Himalayan kingdom) and other areas along the lower, warmer Himalayan slopes.

References in the medical treatises of Charaka and Susruta, founders of the Indian system of medicine called Ayurveda, which literally means ‘the science of life’, give further evidence of the immemorial history of the rose in India. These seers are believed to have lived in the 1st century B.C. Medicinal properties of the various rose species were well known and the characteristic Sanskrit name (the language in which all ancient texts were written) given to each rose signified its curative properties for particular ailments. Various scriptures like the Samhitas and Nighuntas elaborately discussed the rose’s medicinal virtues. It was considered to be cooling, it was bitter in taste, it was a laxative, an astringent, an expectorant, an appetizer, it cured fevers and boils, it lessened stomach burning, good for Pitta and vayu, etc. For example, in the ‘Charaka Samhita’ (i.e., the treatise of Charaka), the rose was named in many different ways:

1. "satapatri" or “sata patrika” (“having 100 petals”). This is perhaps akin to the *R. centifolia* of the Romans and Greeks, which Graham Thomas identifies as *R. damascena bifera* (rubra x moschata) the Autumn Damask rose, (now generally recognized as *Rosa x damascena* 'Semperflorens' Loisel. et Michel, and not, obviously, the later *R. centifolia* of the 18th/19th centuries, which first arose in Holland.4) The word 'satapatripushpam' or 'Shatapatrapushpam' occurs in many of the slokas in pujas dedicated to many gods - Lakshmi, Gauri, Saraswati, Shiva etc as 'satapatripushpam samarpayami'.

In the 'Venkateswara Suprabhatam' (The Morning Invocation to Lord Venkateshwara) the verse reads: "Padmesha mitra shatapatra gathaali vargaam; hartyu shriyam kuvalayasya nijaadgalakshmyaa'. This invocation is said to have been written by Prativadi Bhayankaram Sri hastigiri Annangara Acharya Swami, who was a contemporary of Sri Manavaala Maamunigal and Sri Naayanaacarya, and lived in the early 15th century.

2. "sivapriya" (“loved by God Siva” - who lived on Mount Kailash in the Himalayas)
3. "saumyagandha" (“having a pleasant smell”)
4. “gandhyadya,” (‘rich in fragrance’)
5. ”bringavallabha” (‘liked by bees’)

It was also called “susita,” “sumana,” “suvritta,” (all generally meaning pleasant and agreeable) ‘vrittapushpa‘ (rounded flower, perhaps *R. moschata*, though Albizzia lebbeck, kadamba and other flowers are so named) ‘karnika’, ‘kubjaka‘, ‘charukesara‘, ‘atimanjula‘, ‘sevantika‘, and ‘tarunipushpa‘. 5)

But in Sansrit texts, the same name was used for different plants, so depending on the context, translators have decided whether it was the rose or perhaps the Trapa bispinosa, or crossandra or some other plant which was meant in the original text.

Kanyakubja was the ancient name for present day Kannauj located in the state of Uttar Pradesh. Traditionally Kannauj has been famous for perfumery and rose water. Certainly in present day India and in the earlier times of the Mughals, rose oil and rose water are/were produced in this area. And as 'kubjaka' is a name for rose (Monier William's Sanskrit Dictionary calls it *R. moschata*) it can be deduced that 'the Sanskrit name of the town 'Kanyakubja' was because of the roses grown and rose products made. Kanyakubja was the capital of King Harshavardhana (606 – 647) and was the cultural centre and most prosperous city in north India even later under the Gurjara Pratiharas, and indeed till the advent of the Muslims.

The circa 800 A.D. text, “Kashyapiyakrishisukthi’ (the sage ‘Kashyapa’s Agricultural Treatise’) mentions that ‘a king should perform his royal responsibilities by planting, within the boundaries of his kingdom and the walls of his palace/fort, many trees and shrubs, climbers and bushes’, and the rose, ‘karnika’ is one of the plants mentioned.

In the 15th century manuscript, ‘Visva-vallabh’ of Chakrapani Misra, the rose, called ‘shatapatri”, is mentioned, among other plants, as an indicator of underground water, and also as a plant which should be planted with others, which will yield flowers and fruit, in the garden of the king inside his fort. 6)

Gautama the Buddha lived in the 6th century B.C. The Gandhara School of

Sculpture (1st century B.C. to 2nd century A.D.), which fused Indian and Greek traditions, represented the Buddha in stylized positions. (The Greek influence is due to Alexander the Great who invaded India in 327 B.C. He is reported to have sent back a rose plant from here to his mentor, Aristotle). Most show the Buddha sitting on a pedestal of lotuses, but a few show him seated on a 5-petaled flower - most likely a rose, or so rosarians would have it! 7)

Coming forward into the Christian era, the monk Vatsyayana, who wrote the 'Kama Sutra' (Manual of Love) sometime between the 1st and 3rd centuries A.D., mentions that one of the duties of a virtuous wife is to tend a garden.

'In the garden she should plant beds of green vegetables, bunches of sugarcane and clumps of the fig tree, the mustard plant, the parsley plant, the fennel plant and the xanthochymus pictorius, clusters of various flowers, such as the Trapa bispinosa,' (the word used in the original Sanskrit text is 'kubjaka' which is also used for rose) 'the jasmine, the Gasminium grandiflora, the yellow amaranth, the wild jasmine, the Tabernaemontana coronaria, the CHINA ROSE' [some authorities think 'China rose' refers to the hibiscus, as that is the term by which hibiscus was called for a long time, but the very fact that Burton, the translator, interpreted the Sanskrit word in the original text as 'China rose' leaves some doubt] 'and others should likewise be planted, together with the fragrant grass Andropogon schoenanthus, and the fragrant root of the plant Andropogon miricatus. She should also have seats and arbors made in the garden in the middle of which a well, tank, or pool should be dug'. (Translated by Sir Richard Burton). 8)

Vatsyayana also mentions in his list of occupations, the 'maalakara' or maker of garlands,and the 'gaandhika' (perfumer).

Again, in the 'Ananga-ranga,' of about 1172 A.D., its author, the scholar-poet-prince Kalyana Malla, described the ambience of a room best suited for amorous interludes in "rosy" terms as follows:

Choose the largest and finest and most airy room . . . purify it thoroughly with whitewash, and decorate its spacious and beautiful walls with pictures and other objects upon which the eye may dwell with delight . . . . place musical instruments especially the pipe and the lute . . . with refreshments as coconut, betel leaf and milk . . . bottles of rose water and various essences. (Translated by Sir Richard Burton). 9)

Rose water distillation, known in India from earliest times, is mentioned in the 'Charaka Samhita' and elaborated in another Sanskrit text, the 'Arkaprakash', in which the Buddhist monk, Nagarjuna, who lived in central India (now the state of Andhra Pradesh) sometime between the 1st - 3rd or 8 - 9th centuries A.D. (historians differ on his dates because so little is known of his life), and was an alchemist, is said to have delineated the process of distillation. Historically, there seem to have been two Nagarjunas. Acharya Nagarjuna, the famous propagator of the Mahayana branch of Buddhism lived around 200 C.E. He was a philosopher, alchemist, scientist and physician and is credited with the invention of many medicines made out of roots, herbs, and other plants. He is said to have treated the Satavahana rulers and also edited Sushruta Samhita, written by Sushruta, the surgeon. The famous Nagarjuna Konda (hill) in Andhra Pradesh is named for him. (There was another Nagarjuna who belonged to a later time, the middle ages).

Avicenna (Ibn Sena) in Arabia around the 10th century is also credited with refining the distillation process.

The rose used by Avicenna, and possibly by Nagarjuna and others in India, was the Autumn Damask Rose x bifera, i.e., R. damascena var. semperflorens. (This is the Autumn Damask, the ‘monthly rose’, which is repeat flowering and not the Kazanlik rose). As Graham Stuart Thomas has written, “In modern times, the Autumn Damask rose is still preferred to any other kind for the commercial production of rosewater and attar of roses as in the old days . . . there are vast plantations in . . . India” 10) where it is commonly called the ‘Bussorah rose’.

In the early part of the 19th century, Bishop Reginald Heber who visited India’s northern provinces, and wrote ‘A Narrative of a Journey through the Upper Provinces of India' in 1824, observed,”Ghazipoore is celebrated throughout India for the wholesomeness of its air and the beauty and extent of its rose gardens”.(Pg 265) 11)

The Gita Govinda of poet Jayadeva, written in 1150 A.D. and called the “Indian Song of Songs” by Sir Edwin Arnold who translated it in 1879, mentions the rose in many contexts - ‘roses glowing after rain’, ‘rosy days of Springtime’, ‘roses stirred by winds’, ‘rose-thrones’, ’rose-leaf hands and palms’ ‘fragrant roses and jasmines’, ‘rose couches’, ‘birds’ wings stirring roses’, ‘rose-buds’, ‘rose-red lips,’ and ‘rose-leaf feet’. 12)

Evidence indicates trade with China existed as early as the 2nd century B.C., when a chief of the Yue-chi (Tartar) tribe of Central Asia took Buddhist scriptures to China (after the Indian monk, Kasyapa Matanga introduced Buddhism to China). Chinese pilgrims who visited Buddhist sites talk of rose garlands being commonly used. Fa Hien and Hiuen Tsang, two Chinese travelers (5th and 7th centuries A.D., respectively) to India, mention in their diaries that beautiful gardens with a variety of plants including roses, fountains, streams and tanks of clear water were part of garden landscapes.

The native Indian red water lily, Nymphaea rubra, cultivated since very early times, was obviously taken to southern China by 250 A.D as a work of the Six Dynasties period records cultivation of this species in the palace gardens. Ships sailed via India, from the Persian Gulf and sometimes Ceylon, before rounding the

Malay peninsula and heading up the S. China Sea.

And as there was much trade and commerce between the S. Indian Kingdoms and S.E. Asia it is very likely that among other things, plants and seeds too were exchanged. As early as the 3rd century A.D. Jasminum officinale and Jasminum sambac, which obviously were brought from India, were recorded as being popular in Gungzhou. (Peter Valder in "Garden Plants of China" 12a) quotes from E.H.Schafer "Notes on as Chinese word for Jasminum' in the Journal of the American Oriental society, 68 1) pgs 60-65). Valder also mentions 'another very old route, little used until about the 8th century A.D., led from India into Burma and thence to Yunnan and Sichuan.'

Trade with China, as with many other eastern and western countries, was carried on over the centuries by the various kingdoms ruling different parts of India, and rose products were very much a part of such commerce. For instance, the Piranmalai (a place in South India) Stone Inscription of the 13th century, which describes the various items of trade undertaken by 'The Guild of Five Hundred' in the Chola/Pandya kingdoms of South India, (both from West Asia and South East Asia as India was a halfway house - for both transit and terminal trade for commerce between West Asia and China through Sri Lanka and South East Asia), mentions rose water, along with sandalwood, silk, camphor, aloeswood, elephants and horses. 13)

Gavin Menzies in his book "1421: The year China Discovered the World" (Bantam Books 0 55381522 9, published first in 2002) mentions that Chinese sailors when embarking on long voyages from home, would invariably take pots of fragrant roses, to remind them of home. "In the long months they (the sailors) would spend traveling the oceans, their only remaining links to their native land would be memories, keepsakes and the scented roses many brought with them, growing them in pots and even sharing their water rations with them" (pg 71).

Admiral Zheng, he made 6 voyages from China in 'treasure fleets' going to Calicut and further, round the cape of Good Hope, and upto the Americas.

Gavin Menzies writes (pages 67-69): "Through interpreters, chinese mathematicians, astronomers, navigators, engineers and architects would have been able to converse and learn from their counterparts throughout the Indian Ocean. Once the ambassadors and their entourages had disembarked (they had gone to the court of the Chinese emperor) the vast ships with their labyrinths of cabins would have been well suited to use as laboratories for scientific experiments. Metallurgists could prospect for minerals in the countries the Chinese visited, physicians could search out new healing plants, medicines and treatments that might help combat plagues and epidemics, and botanists could propagate valuable food plants. Chinese agricultural scientists and farmers had millennia of experience of developing and propagating hybrids".

The native Chinese flora is perhaps the richest in the world. “In wealth of its endemic species and in the extent of the genus and species potential of its cultivated plants, China is conspicuous among other centers of origin of plant forms. Moreover the species are usually represented by enormous numbers of botanical varieties and hereditary forms”. (N.I. Vavilov, “The origin, Variation, Immunity and Breeding of Cultivated Plants” translated K.S. Chester, Chronica Botanica, Vol. 13, Waltham, Mass., 1949-50; and J. Needham, Science and Civilization in China, Vol. VI, Pt 2, sec.41, pg 428).

‘In Europe, a long period of economic and agricultural decline followed the fall of the Roman Empire. The plant forms known to the Western world from Theophrastus to the German fathers of botany show that European knowledge had slumped, but there was no corresponding ‘dark age’ in Chinese scientific history. Botanical knowledge, and the number of plant species recorded by the Chinese grew steadily as the centuries passed. The contrast between the voyages of discovery of the Chinese and those of the Europeans cannot be overestimated. The only interst of the Spanish and the Portuguese was in gathering sustenance, gold and spices, while warding off attacks of the natives. The great Chinese fleets undertook scientific expeditions the Europeans could not even begin to equal in scale or scope until Captain Cook set sail three and a half centuries later’.

There was a historian who traveled with the fleet. His name was Ma Huan, to document the voyage. His diaries, “The Overall Survey of the Ocean Shores” were published in 1433 after Zheng He’s final voyage. The official historian Ma Huan described the Chinese voyage from China via Malacca to Calicut in great detail: no fewer than 9 pages of his account were devoted to the city. He gave an enthralling account of life in a medieval Indian city through Chinese eyes, noting the religious practices of the Zamorin king in contrast to his Muslim subjects, and bringing to life the habits of the people, their festivals, music and dancing, clothing and food.

Another stone pillar inscription dated 1244 A.D. at Motupalli near Guntur on the eastern coast, relates that King Ganapati, belonging to the Kakatiya Dynasty of Warangal, waived the customs duties on various items from China, including rose water. Marco Polo, the Venetian traveller, visited this kingdom in 1288 A.D. - around the same time. 14)

The famous temple of Somnath in Western India, (one of the 'jyotirlingams' of the God Shiva) which was devastated by Mahmud Ghazni in around 1000 C.E, was rebuilt many times. An inscription dating to 1287 (Vikram Samvat 1343) records that on Monday, the 5th lunar day of the bright half of Magha, Vikrama Samvat 1343, the consecration of 5 'lingas' of the temple took place. Verse 50 of the inscription states: "The guild of the gardeners shall furnish daily 200 white roses (shatapatra) and 2000 fragrant oleander blossoms (kanavira/karavira)". "Datvyam maalikashreynya shatapattrashatadvayam, naveenakaraveeranam dve sahasrathe cha nityasham.

Verse 65 states. "The best among these, the illustrious Chaturjataka" (a title of a local high official), "who wears the garland of faith in god Shiva, made over to the gardeners in exchange for their daily furnishing the quantity of flowers requires for worship". (This was apparently the remuneration for which the guild of the gardeners furnished the flowers, says the author of 'Somanatha - The Shrine Eternal', Mr K.M. Munshi)

Interestingly, this inscription is in the form of a stone tablet and is called 'The Cintra Prashasthi of the Reign of Sarangadeva'.

"A copy of the subjoined inscription was first published in Murphy's Travel in Portugal (1798)" (Murphy, James Cavanagh, 1760-1814, 'Travels in Portugal, through the provinces of Entre Douro e Minho, Beirs, Estremadura and Alem-tejo, in the years 1789 and 1790, consisting of observations on the manners, customs, trade, public buildings etc; London A. Strahan (etc) 1795) "together with the translation of Sir Charles Wilkins. The plate was reproduced 10 years ago by Dr Burgess in No. 9 of the Memoranda of the Archaeological Survey of Western India (B.B. 1879 page 104) with the restoration of the Sanskrit text by the late Dr Bhagavanlal Indraji. Dr Bhagavanlal's text is generally correct and reflects the highest credit on his ingenuity, since the copy on which he worked is very inaccurate. Still I believe that a new edition will not be superfluous. The inscription is incessed with great care and neatness on a long slab of polished stone measuring 42 inches by 20, and containing 66 lines. The stone is now preserved in the Quinta of Don Joa de Castro at Cintra in Portugal, but as the contents of the inscription show, it originally belonged to a temple at Somnath or Devanapattana of Sorath." This passage is taken from the Introduction to the book “Somanatha-The Shrine Eternal” by K.M.Munshi, 4th Edition December 1976. (Sir James Burgess: Report on the Antiquities of Kathiawad and Kachh, being the result of the Second Season's Operation of the Archaeological Survey of Western India 1874-5, vii 91) 242 pages, 1 folding map, cloth. Reprint edition Varanasi (Indological Book House) 1971 $.50.00).

Clearly, roses were very much a part of the Indian social, medical, cultural and religious fabric reaching far back into Indian history.

Kalidasa, the well known Sanskrit poet has also referred to roses in his works. In the “Book of perfumes” by Eugene Rimmel, published by Chapman and Hall, 1865, original from Harvard University, digitized by Google books on 5 may 2008, on page 142 it says:; “Ina an Indian ode called Meghaduta, translated by Paterson, there occurs also, the following passage, alluding to the same fashion’ (of using flowers and perfumes for personal use)

‘The rose hath humbly bowed to meet

With glowing lips her hallowed feet,
And lent them all its bloom'.

While not well-known in the West, India is one of the countries in which Christianity was established early, even by its first generation of preachers. The apostle St. Thomas arrived on India's western shores nearly 2000 years ago, in 40 A.D. He died in a place called 'Mylapore' ('the place of peacocks'), which is today a suburb of Madras (now called Chennai, the capital of the state of Tamil Nadu in southern India).

There stands to this day a superb church called the San Thome Cathedral, referred to by St. Gregory, Bishop of Tours in France in 590 A.D.in his 'Gloria Martyrum':

His [St. Thomas'] holy remains, after a long interval of time, were removed to the city of Edessa in Syria and there interred. In that part of India where they rested, stand a monastery and church of striking dimensions, elaborately adorned and designed.

One of the most intriguing designs is a gateway with stone pilasters and a lintel. On the inner surface of the lintel is a Cross on a Calvary between two peacocks, and on either side are three 8-petalled roses. The peacocks perhaps refer to the place - Mylapore ('mayl' means peacock) - though they are a common Christian decoration. But what of the roses?15) Do they depict roses brought by St Thomas from Jerusalem or Parthia (of which he was native) and, if so, what species could they have been?

The Vijayanagar Empire was, from the 14th to the 16th centuries, one of the great Hindu dynasties of South India. Accounts of travellers show that roses were integral to the daily life of both aristocrats and commoners in the Vijayanagar Empire.16) Domingo Paes and Fernaz Nunis, two Portuguese who came to this kingdom around 1537 A.D., mention seeing plantations of roses and bazaars where baskets laden with roses were sold, both as loose flowers and made up into garlands. They described the gardens of the nobility as containing rose plants which flowered profusely.

In the Vijayangar Empire, both men and women from all walks of life used roses in great quantities as ornamentation. And it is related that the King, dressed in robes of pure white, embroidered with golden roses, and bejeweled, would daily, following on his morning prayers, shower white roses on his favorite courtiers, his favorite elephants and horses, which were bedecked with chaplets of roses; and that the King's bedchamber "had pillars of carved stone, the walls all of ivory, as also the pillars of the cross-timbers, which at the top had roses carved out of ivory, all beautifully executed and so rich and beautiful that you would hardly find anywhere another such." 17)

These are the remarks taken from the narrative of Paes, from Robert Sewell's 'A Forgotten Empire':

"The king was clothed in certain white cloths embroidered with many roses in gold...." this is said when Paes accompanied Christovoa de Figueiredo, whom the Governor of Goa sent as his emissary to the Vijaynagar Court, Paes describes the 'House of Victory'thus: "The king has a room made of cloth, with its door closed where the idol has a shrine; and in the other, the middle (of the building), is placed a dais opposite the staircase in the middle; and on which dais stands a throne of state made thus - it is four sided, and flat, with a round top, and a hollow in the middle for the seat. As regards the woodwork of it, you must know that it is all covered with silk cloths and has lions all of gold, and in the spaces between the cloths it has plates of gold with many rubies and seed-pearls, and pearls underneath; and round the sides it is all full of golden images of personages, and upon these is much work in gold, and many precious stones. In this chair is placed an idol, also of gold, embowered in roses and flowers." (pg 265 of The Narrative of Paes (written probably A.D. 1520-1522) in “The Vijaynagar Empire, Chronicles of Paes and Nuniz,” Asian Educational Services, paperback edn)

"You must know that when it is morning the king comes to this House of Victory, and betakes himself to that room where the idol is with its Brahmans, and he performs his prayers and ceremonies. Outside the house are some of his favourites, and on the square are many dancing girls dancing. In their verandahs round the square are many captains and chief people who come there in order to see; and on the ground, near the platform of the house, are eleven horses with handsome and well arranged trappings, and behind them are four beautiful elephants with many adornments. After the king has enetere inside he comes out, and with him, a Brahman who takes in his hand a basket full of white roses and approaches the king on the platform, and the king, taking three handfulls of these roses, throws the to the horses, and after he has thrown them he takes a basket of perfumes and acts towards them as though he would cense them; and when he has finished doin this, he reaches towards the elephants and does the same to them. And when the king has finished this, the Brahman takes the basket and descends to the platform and from thence puts those roses and other flowers on the heads of all the horses and this done, returns to the king." (pg 266)

"The king sits” (to watch wrestling matches) "dressed in white clothes all covered with (embroidery of) golden roses and wearing his jewels" (pg 269).

When the fireworks are done... and the carshave gone out, "they are immediately followed by many horses covered with trappings and cloths of very fine stuff of the king's colours, and with many roses and flowers on their heads and necks and with their bridles all gilded" (pg 272)

While describing the king's personal apartments which Paes and others of his group were taken on a conducted tour (as very few people were allowed inside) after they had received passes for going into these chambers: "In this house there is a room with pillars of carved stone; this room is all of ivory, as well the chamber as the walls, from top to bottom, and the pillars of the cross-timbers at the top had roses and flowers of lotuses all of ivory, and all well executed, so that there could not be better- it is so rich and beautiful that you would hardly find anywhere another such". (pgs 285-6)

In the Chronicle of Nuniz, (written probably A.D. 1535-37) describing the nine day festivities and prayers done at Navarathri (Dussehra) time, always in October)" There come nine horses and nine elephants of the King, and these come before the King ('who sits on a throne of gold and precious stones, he never sits on this except only this once in a year') - covered with flowers - roses - and with rich trappings. Before them goes the Chief Master of the Horse, with many attendants, and they make salaam to the King. And when these have finished making their salaam, there come from within priests, and they bring rice and other cooked edibles, and water, and fire, and any kinds of scents, and they offer prayers and throw the water over the horses and elephants, just as our priests do with holy water; and they put chaplets of roses on them". (pg.377)

While describing the gruesome practice of Sati - widow burning on the funeral pyre of her husband, Fernao Nuniz says:

"They put the woman - the widow - on the back of a worthless horse, and she goes.. with many jewels on her and covered with roses”. (pg 391).

Abdur Razzak, a Muslim diplomat from Persia, who visited the same Vijayanagar court in 1443 A.D., writes, “Roses are sold everywhere. These people could not live without roses and they look upon these as quite as necessary as food.” Rose perfume making also was known and, in fact, rose perfumes were exported to other countries.18)

N. Venkataramanayya in his "Studies in the History of the Third Dynasty of Vijayanagar" (Gian publishing house, N.Delhi) page 376, says "The people of this age had an insatiable love of sweet smelling flowers. Among the flowers that had no fragrance, they liked only the lotus, the others were treated with contempt. Rose, jasmine, campak, jaaji, virajaaji, malli, ketaki etc were the favourite varieties for which people had a special fondness. Men wore flower garlands on their heads and around their necks. It was customary to hang flowers across doorways. Very often in summer, flowers were spread on couches. Each house had its own flower garden where several varieties of flower bushes were grown by trained gardeners".

Duarte Barbosa(? - 1521) the Portugese traveller, says of the perfumes in Vijayanagar, according to N. Venkataramannya: 'The substances with which they are always anointed are these: white sanderswood, aloes, camphor, musk and saffron, all ground fine and kneaded with rose water. With these they anoint themselves after bathing and so they are always very highly scented'. (Pg 205)

"People made use of rosewater, specially in summer on a large scale. They showered it on their bodies from small spouted leather bottles".

"Bathing, called abhyangana of the princes and princesses = young girls sprinkled rose water over heads now and then. Rose water perfumed with Goa civet was poured over the head without interruption". (page 886)

"Baths of royalty: It was customary for them to take the abhangana daily just before they sat at dinner. Young damsels anointed the head with fragrant oil of champaka flowers, then they proceeded to carefully disentangle the hair with their fingernails, sprinkling rose water on the head now and then. Next they applied the paste called 'atakali', prepared from sandal wood and 'usirikai' (Phyllanthus emblica, the Indian gooseberry) seeds. Rose water perfumed with goa civet was pured over the ehad without interruption." (page 386)

"The flowers gardens attracted much attention of the Portugese traveller: "The city of Vijaynagar is said to have had a plentiful supply of flowers, especially roses, at all times of the year. The desire of the people for sweet scented flowers appears to have been insatiable. They wore them as garlands on their heads and around their necks. Women decorated their hair. Rich people strewed their beds with flowers. Every nobleman kept a flower garden of his own and so did every temple."

Niccolo de Conti (1395-1469) Venetian merchant and explorer who travelled to India in the early 15th century and wrote "Les Voyage Aux Indes, 1414-1439" visited Vijayanagar in 1420 and wrote "The whole city was full of gardens".

India, while largely a Hindu country, contains one of the largest Muslim populations in the world. In 1300 A.D., a Muslim traveler, chronicler and historian, Rashid-ud-din, 1247-1317 (whom Robert Browne considered the most reliable of Persian historians and a model of clarity), visited Gujarat State in Western India. He remarked that 'the inhabitants are rich and happy, and during the four seasons, no less than seventy different sorts of roses blow in this country". 19)

Ibn Batuta (1304-1377) in his travels called "Rihlah" came to India and Delhi in during the reign of Sultan Muhammad bin Tughlak. He writes that during feast days there are " gold and silver barrels, carried by pages and filled with rose water, with which they sprinkle those present broadcast".

"When the Sultan returned from a journey the ceremonial welcome given to him in Delhi was most elaborate - "the elephants are decorated and parasols raised on them, some brocaded and some with jewels ... wooden pavilions are built several storeys high and covered with silk cloths ... in the centre of each pavilion there is fashioned a large tank made of skins and filled with rose syrup dissolved in water, from which all the people ... natives or strangers may drink'."

K.T. Achaya in his book “Indian Food” describes the dining customs of the Delhi Sultans; “Before the dinner begins, the chamberlain stands at the head of the dinner carpet and performs the bow in the direction of the sultan, and all present do the same. After this the people sit down and then are brought gold, silver and glass cups filled with sherbet flavoured with rose water. After they have taken the sherbet, the chamberlain calls out ‘Bismillah’. Then all begin to eat.”

"When Ibn Batuta's year old daughter died in Delhi, a few months after his arrival there, one funeral rite was, he writes, the 'spreading of carpets and silk fabrics on all sides of the tomb and placing on it flowers of which there is a never ending supply there in all seasons of the year such as jasmine, gul shabah' (the night scented rose)' which has yellow flowers... raibul which is white '(Arabian jasmine)' and nisrin' (musk rose) “which is of two kinds, white and yellow."

"Ibn Batuta visited the Maldives, the islands off the west coast of India, the 'vizier's people brought in betel and rosewater, this being their mark of honour”

"Ibn Batuta visited Adam's Peak mountain in Ceylon (Sri Lanka) and he writes that on the way up to the peak where there was a shrine, he saw many “evergreen trees and flowers of various colours including a red rose as big as the palm of a hand. They maintain that on these roses there is writing in which can be read the name of Allah and the name of his Apostle." 19a)

“This has been identified as *Rhododendron arboreum* subspecies *nilagaricum* (Curtis' Botanical magazine, plate 9323) and must be the earliest mention of any rhododendron in South Asia, although it was not until 1817 that a John Davy recognised it as being a member of that genus”. 19b)

A well known 16th century Muslim poet, Malik Muhammad Jaisi, wrote in his epic poem, ‘Padmavathi’ (which, surprisingly, is about a Hindu princess) “rays were emanating from her red lips which looked like newly grown rose leaves.” 20)

The Italian traveller, Ludovico de Varthema, from Bologna, who came to the west coast of India in 1503, by the overland route through Mecca, Medina and Taessa (the present Ti'zza of Yemen, on the Red Sea) has this to say about Calicut: "This country produces innumerable flowers of great beauty and most pleasant flavour, all the year round, and especially roses, both red, white, and yellow". 20a) Repeated commentaries from Burton to the present aver that Varthema was a particularly observant and accurate reporter as opposed to a fantastical one. Centuries later Burton notes that the Varthema descriptions of customs and mores in Mecca were as accurate as could be.

In the 16th century the Muslim Mughal emperors came from Persia and Afghanistan to rule India. The first Emperor Babur (1483-1530) brought camel loads of roses, perhaps musk roses and perhaps the damask rose into India. 21)

His love for roses is epitomised by his poem:

My heart, like the bud of the red, red rose,
Lies fold within fold aflame,
Would the breath of even a myriad Springs
Blow my heart's bud to a rose? 21a)

He never lost an opportunity to plant roses. The Persian Garden of Paradise - the Bagh-I-Bihisht is central to the Islamic, and in India, the Mughal theme of gardens. Babur celebrated his vanquishing of the reigning Indian king at the Battle of Panipat (1526) not by raising a victory tower (as was usual in those days) but by implanting gardens of geometrical symmetry and order in Delhi, Agra and Daulpur, where roses and narcissus were planted in every bed "in perfect arrangement" 22) The garden at Agra, called Gul Afshan by him (which later became Aram Bagh - the Garden of Rest) epitomized his principle that a formal garden was an essential requirement of a civilized life. 23)

Babur, in fact, was so enamoured of roses that he named his daughters, Gulbadan ('rose body'), Gulrang ('rose colour'), Gulchihra ('rose cheeked'), and Gulrakh ('rose-faced')! 24)

While describing the jasun (*Hibiscus rosa-sinensis*, which had reached India from China) Babur notes that the flower "is fuller in colour than that of the pomegranate and maybe the size of the red rose, but, the red rose, when its bud has grown, opens simply, whereas, when the jasun bud opens, a stemon which other petals grow, is seen like a heart amongst its expanded petals". 24a)

The miniatures in a version of the Baburnama of about 1590 are among the earliest surviving Mughal drawings of Indian plants and animals (now in the British Libraray).

Kashmir, the summer retreat of the Mughal court was especially dear to Babur. "Its pleasant meads and enchanting cascades are beyond all description.....the red rose, the violet and the narcissus grow of themselves; in the fields, there are all kinds of flowers and all sorts of sweet scented herbs more than can be calculated" 24 b)

When Emperor Humayun (Babur's son) had to flee from India to Persia (after being defeated by Sher Shah Suri, an upstart, he was treated with courtly hospitality by Shah Tamasp, the Persian king. The latter being a stickler for detail, sent minute and precise instructions to his governors on the manner in which the fleeing Emperor was to be treated. Rose water sherbet at every horse-stop, dinners with rose water candies and sweetmeats, rose water and ambergris perfumes were to be sprinkled on the floors of the royal tents. 25)

These royal tents were masterpieces of ingenuity and design, their size and opulence testifying to the importance of the ruler. From Timur Lane's time, the art of 'painted tents' called 'Qanats' - they were veritable cities - had been perfected. For many years Babur lived only in such tents in India, set out in gardens, each tent a room, at different terraced levels. In fact the Mughals love of gardens, outdoor living and intense love of nature encouraged them to live happily in these huge tents, using their gardens as others use buildings. The tents would be lavishly bedecked and decorated, and very often the decorations would be of painted or appliquéd roses.

The third Emperor of the Mughal dynasty, Akbar (1556-1605) would invariably travel with camel-loads of roses as gifts for the wives of his allies. And he said: “Heresy and orthodoxy stand not behind the screen of truth - heresy to the heretic, orthodoxy to the orthodox. But only the dust of rose petals remains to the seller of perfumes.” 27)

Akbar’s fondness for perfumes was well known. His Court Hall had to be continuously scented with fragrances, especially of roses (he himself made up combinations of fragrances), and all his living areas had to be decorated with huge quantities of flowers. 28)

Abul Fazl, Akbar's court poet, wrote on the occasion of 4 year old Salim (who became Emperor Jehangir later) 's circumcision:

> 'Was the petal of the red rose scattered by the wind
> Or did the rosebud draw the veil from her face?
> Nay, nay; when the fruit of the tree of desire formed,
> The expended blossom dropped from the branch'. 27a)

The Mughals had a great interest in art and architecture, poetry and music. And so they developed a characteristic Mughal style of gardening, called the ‘char-bagh’ (literally, ‘four quadrants’) style whose chief features were a very formal plan with geometrical beds, fountains, paths, water runnels and borders, all done on a grand scale. Every edifice they built, like the Taj Mahal, which had marble inlay designs of roses, lilies, narcissi and other flowers, had rose gardens lavishly planted by these Mughal rulers.

'Babur... created his Indian gardens in the Persian style of a square divided into four by the crossed arms of a water course or channel, known as a charbagh or fourfold garden. Water, the elixir of life, and an essential component of all Persian and Mughal gardens, flowed through shallow channels into ornamental pools linking the various elements of the garden, contributing to the mood of tranquillity and contemplation. Fruit trees and cypresses, symbolic of life and death respectively, provided shade and contours, and bulbs and annuals were freely planted in parterres or scattered in lawns - all confined within high boundary walls. A Mughal garden was an affirmation of Muslim concern for order and pleasure in geometry.' 28a)

The famous Shalimar gardens of Kashmir, on the Dal Lake, against the backdrop of the great Himalyas, built by Emperor Jehangir (1605-1627) for his Empress Nur Jehan, are well known to this day. In fact, Jehangir speaks of India “as possessing every sort of rose, particularly the musk and damask”. 29) At a much later date this is the garden which “delighted visitors with the incredible display of 'Maréchal Niels' which were planted to climb the grey-green walls of the Hall of Public Audience to hang their soft yellow globes head downwards in clusters from the carved cornices.” 30)

This same Empress, Nur Jehan, so celebrated for her beauty and intelligence, is credited with discovering attar (or Otto) of roses. It has been related by many authors, including Sir George Watt in his Dictionary of Economic Products of India (1896) that, as she was taking a royal bath in hot rose scented water, she saw a concentrated foam forming which had an indescribable rose fragrance. She collected this foam, and, from it discovered the attar of roses. But according to Emperor Jahangir, (her husband), “This ‘itr’ is a discovery which was made during my reign through the efforts of the mother of Nur Jehan Begum. When she was making rose water, a scum formed on the surface of the dishes into which the hot rose water was poured from the jugs. She collected this scum little by little; when much rose water was obtained a sensible portion of the scum was collected. It is of such strength in perfume that if one drop be rubbed on the palm of the hand it scents an entire assemblage, and it appears as if many rose buds had bloomed all at once. There is no other scent of equal excellence to it. It restores hearts that have gone and brings back withered souls. In reward for that invention I presented a string of pearls to the inventress. Salima Sultan Begum (may the lights of good be on her tomb) was present and she gave this oil the name of ‘itr-I-Jahangiri’” 31)

Jahangir is reputed to have had streams, past which Nur Jehan walked, filled with rose water, so that she would breathe in only perfumed air.

In his memoirs, Jehangir vividly expresses his delight in the Kashmir scene. “Wherever the eye reaches, there are verdure and running water. The red rose, the violet and the narcissus grow of themselves, in the soul enchanting spring the hills and plains are filled with blooms; the gates, the walls, the courts, the roofs are lighted up by the torches of banquet adorning tulips. What shall we say of these things or of the wide meadows and the fragrant trefoil?

The garden were brilliant
Their cheeks shone like lamps;
There were fragrant buds on the stems
Like dark amulets on the arms of the beloved.
The wakeful, ode-rehearsing nightingale
Whetted the desires of wine drinkers;
At each fountain the duck dipped his beak
Like golden scissors cutting silk;

There were flowercarpets and fresh rosebuds,
The wind fanned the lamps of the roses,
The violet braided her locks,
The buds tied a knot in the heart." [31a)]

Mr Edward Terry in his "Relation of a Voyage to India in 1616 with Observations respecting the dominions of the Great Mogul" remarks, 'All trees in the southern parts of India" (he talks of Surat) "are perpetually clothed in verdure. Their flowers rather delight the eye than please the sense of smelling, having beautiful colours, but few of them, except roses and one or two other kinds are any way fragrant". [31b)]

The next Emperor, Shah Jahan, who built the Taj Mahal in memory of his wife, Mumtaz Mahal, was also a great garden-maker (his Shalimar Garden of Lahore was considered to be of rare beauty) and builder, and a patron of aesthetics. He commissioned the drawing, by his best court painter, Goverdhan, of the famous manuscript 'Gulistan' ('Rose Garden') written by Sa'adi in 1258 A.D. in Persia.[32)] When Sa'adi saw a friend had gathered rose flowers in his skirt, he admonished him; "They have such a short life span". When the friend asked, "then what is to be done?", Sa'adi replied, "I will write a book of a Rose Garden, a Gulistan, whose leaves cannot be touched by the tyranny of autumnal blasts and the delight of whose spring of viccissitudes of time, will be unable to change into inconstancy of autumn." [33)]

'Of what we will a dish of roses to thee
Take a leaf from my rose garden
A flower endures but five or six days
But this rose garden is always delightful'. [33a)]

In the Taj Mahal gardens, the parterres were obviously full of rose plants because, as Ray Desmond says "when Alexander B. Westland took charge of the Taj gardens in November 1891, its rampant disorder offended his sense of neatness and authenticity, and he recommended .... there were to be fewer rosebeds". Earlier when Bishop Heber visited the Taj Mahal in 1824 he saw "only oranges and other fruit trees, a rash of rose bushes were all that remained" [33b)]

Chronicle accounts state that the princess, Roshanara Begum, Aurangzeb's sister, "escaping from the noise and stifling heat of the royal palace, came in her splendid rose curtained litter, swung between two smaller elephants, to while away a few hours in her cool flower scented fountains and sprinkled gardens" - the gardens which she herself laid out in 1650 and which is even today called the 'Roshanara Garden' near the University of Delhi. [33c)]

Mirabai (1515-46 A.D.), a Rajput princess, was considered to be a saint whose songs of devotion to the Lord Krishna, have come down to the present time. Her husband's family, unhappy at her total preoccupation with religious matters, tried to kill her in many ways - sending a snake in a basket to her, giving her poisoned milk, and making her lie on a bed of nails. But the snake turned into a garland of flowers, the poison into nectar and the bed of nails into a bed of roses! 34)

Both the 'Ain-I-Akbari' ('Life of Akbar'), written by Abul Fazl in Akbar's time, and 'Nuskha Dar Fanni Falahat' ('The Art of Agriculture'), written in 1693 A.D. by Dara Shikoh, Emperor Shah Jehan's eldest son, mention roses - calling them 'seoti', 'nastaran' or 'nasrin'. Firminger identifies 'seoti' as *R. moschata*, 35) and perhaps 'nastaran' is *R. moschata nastarana* as it is of Persian origin and would have, in all likelihood, been the 'musk rose' brought to India by the Mughals. Dara Shikoh (a learned scholar, he was killed by his brother Aurangzeb, who became the last of the Great Mughal Emperors) also mentions another rose - 'gulward' - which his translator identifies as *R. foetida* Herrm. 36)

The 'Ain i-Akbari' too mentions 'kuzah' as being a very fragrant rose, used for making perfumes. 37) Firminger calls this *R. lyelli*, the 'Doon Rose', because it was mostly found in the Dehra Doon area - the plains of the lower Himalayas. (38).

Another book, written in 1762 A.D. the "Risala-e-Baghbani", mentions that if melon seeds are stored in mounds of fresh rose petals, and then sown, the melons become especially sweet!!! 39)

The finest of rose liqeurs was distilled for emperors and royalty. About 20,000 rose flowers were distilled in order to get one bottle of rose liqeur. 40)

According to Manucci, an Italian traveler of the late 17th century, "Everybody knows how dear and scarce essence of roses is . . . yet neither scarcity nor high cost deters them from . . . lavish use on themselves," and in certain instances "from having their horses rubbed with this liquid as a matter of course" 41)

Practically every painting of royalty and aristocracy of this period shows the subject holding a rose in hand. Indeed, roses are considered so much a part of the Mughal period of Indian history it is popularly believed in India that roses came to India only with the advent of the Muslims - from the 10th century onwards.

S.B. Parsons in his book, "The Rose: Its History, Poetry, Culture and Classification" (1847) writes "According to Loudon, "Ludovico Varthema, who travelled in the East in 1503, observed that Taessa was particularly celebrated for roses, and that he saw a great quantity of these flowers in Calicut". The Rose is to this day also extensively cultivated in India, and for commercial purposes perhaps in greater abundance than is now known in any other country. Bishop Heber states that "Ghazepoor is celebrated throughout India for the wholesomeness of its air and the beauty and extent of its rose gardens. The Rose fields, which occupy many hundred acres in the neighbourhood, are described as, at the proper season, extremely beautiful. They are cultivated for distillation and for making 'Attar of

Roses'". He states also, that "many roses were growing in the garden of the palace of Delhi, and the fountain pipes were carved with images of roses". Another writer describes in glowing colors the beauty of Ghazepoor, the Gul-istan (the rosebeds) of Bengal. "In the spring of the year, an extent of miles around the town presents to the eye a continual garden of roses, than which nothing can be more beautiful and fragrant. The sight is perfectly dazzling; the plain, as far as the eye can reach, extending in the same bespangled carpet of red and green. The breezes too are loaded with the sweet odor which is wafted far across the river Ganges".

These statements sufficiently evince that the Rose was not only valued by the Hindoos as an article of commerce, but was intimately associated with their ideas of pleasure and enjoyment.

'The rose of cashmere has long been celebrated in the East, for its brilliancy and delicacy of odor -

'Who has not heard of the Vale of cashmere,
With its Roses, the brightest, that earth ever gave?'.

Throughout the whole season during which the roses remained in bloom in this beautiful valley, the Feast of Roses was kept with great rejoicing, and an entire abandonment to pleasure. At this time, a great number of tents were pitched, and multitudes of men, women, boys and girls, were dancing and singing to the music of their various instruments.' [41a)]

William Paul in his book “The Rose Garden: In Two Divisions” 10th Edition 1903 elaborates on roses grown for distillation: "In Persia, in Turkey, and throughout the East generally, Roses are grown in considerable quantities for the manufacture of rose water and the famed Attar of Roses, which has been sold for six times its weight in gold. The Musk Rose is, I believe, the variety cultivated. The Attar or Otto of Roses is manufactured chiefly at Ghazeepore, in Bengal and in Turkey; but it is also prepared in Persia, in all parts of India, Upper Egypt, and in Tunis. In the Bengal Dispensatory (*The Bengal Dispensatory,* by W.B. O'Shaughnessy, M.D., Calcutta, 1842) is a paper drawn up by Dr. Jackson, on the cultivation of Roses and the manufacture of Rose-water and Attar of Roses.'

"Around the Station of Ghazeepore" says this author, "there are about 300 beegahs, or about 150 acres, of ground laid out in small detached fields as Rose Gardens, most carefully protected on all sides by high mud walls and prickly-pear fences to keep out the cattle. These lands, which belong to Zemindars, are planted with Rose trees, and are annually let out at so much per beegah (a beegah is half an acre) for the ground, and so much additional for the Rose-plants; - generally five rupees per beegah and twenty-five rupees for the Rose-trees, of which there are 1000 in each beegah. The additional expense for cultivation would be about rupees 8.8; so that for rupees 38.8, you have for the season one beegah of 1000 Rose-trees.

"If the season is good, this beegah of 1000 Rose-trees should yield one lac of Roses. Purchases of Roses are always made at so much per lac. The price of course varies according to the year, and will average from 40 to 70 rupees.

"The Rose-trees come into flower at the beginning of March, and continues so trough April.

"In the morning early the flowers are plucked by numbers of men, women, and children, and are conveyed in large bags to the several contracting parties for distillation. The cultivators themselves very rarely manufacture.

"There is such a variety of Rose-water manufactured, and so much that bears the name which is nothing more than a mixture of sandal-oil, that it is impossible to lay down the plan which is adopted. The best Rose-water, however, may be computed as bearing the proportion of 1000 Roses to a seer (2 lbs. troy) of water; this, perhaps, may be considered as the best procurable. From 1000 Roses must generally a seer and a half of Rose-water is distilled; and perhaps from this even the Attar has been removed.

"To procure the Attar, the Roses are put into the still, and the water passes over gradually, as in the Rose-water process. After the whole has come over, the Rose-water is placed in a large metal basin, which is covered with wetted muslin tied over to prevent insects or dust getting into it; this vessel is let into the ground about two feet, which has been previously wetted with water, and it is allowed to remain quiet during the whole night. The Attar is always made at the beginning of the Season, when the nights are cool; in the morning early the little film of Attar, which is formed upon the surface of the Rose-water during the night, is removed by means of a feather, and it is then carefully placed in a small phial, and day after day, as the quantity has been procured it is poured off clear, and of the colour of amber, into small phials. Pure Attar when it has been removed only three or four days has a pale greenish hue; by keeping it soon loses this, and in a few weeks' time becomes of a pale yellow.

"From one lac of Roses it is generally calculated that 180 grains or one tolah (seven pennyweights) of Attar can be procured; more than this can be obtained if the Roses are full sized, and the nights cold to allow of the congelation.

"The Attar purchased in the bazaar is generally adulterated, mixed with sandal-oil or sweet-oil. Not even the richest native will give the price at which the purest Attar alone can be obtained; and the purest Attar that is made is sold to Europeans. During the past year it has been selling from 80 to 90 rupees the tolah; the year before it might have been purchased for 50 rupees.

"At the commencement of the Rose season people from all parts come to make their purchases, and very large quantities are prepared and sold. There are about thirty-six places in Ghazeepore where Rose-water is distilled.

"The chief use the natives appear to make of the Rose-water is at the period of their festivals and weddings. It is then distributed largely to the guests as they arrive, and sprinkled with profusion in the apartments.

"I should consider that the value of the Roses sold for the manufacture of Rose-water may be estimated at 15,000 rupees a year, and from this to 20,000; and from the usual price asked for the Rose-water, and for which it is sold, I should consider there is a profit of 40,000 rupees. The natives are very fond of using the Rose-water as a medicine or as a vehicle for other mixtures; and they consume a good deal of the petals for the Conserve of Roses." 41b)

In the “History of China and India: Pictorial and descriptive” by Julia Carner, W.C. Layton, J.R. Rawlins 1847, page 348-349: ”In the neighbourhood of Ghazepore, a British station on the Ganges, roses are cultivated for the purpose of being made into rose water and the perfume commonly known by the name of otto (or more correctly, attar) of roses”.

In “The Family Magazine” or Monthly Abstract of General knowledge, 1837, Page 182 (published by : Boston: Otis, Broaders & Co., No.147 Washington Street; New York: Lindsay & Redfield, 13 Chambers street; Cincinnati: Eli Taylor)

A Hunt at Gazypoor – From the French:

“When I had made my purchases of otto of rose (atta goul) the merchant (Agoub), a young and fine looking Mohammedan, made me a low salaam and invited me to go to his house, and partake of a collation. I did so. “I beg pardon” said he – hurrying his light repast - “I beg pardon, but I have made an engagement for a hunt, and I am afraid that my friends will wait for me.” “A hunt!” said I, my eyes glistening with delight at the prospect of being of the party. He had already risen; his hand rested on his saber; an Indian slave was about to saddle his horse. “Will you go with us?” said he, “my companions will be happy to see you.- Ghaed, saddle another horse - you are anxious to see the fields of roses” he resumed, “and it is in these that we are going to chase an antelope. To horse and away”. We departed. We soon left Gazypoor in the distance and I found myself in the fields of roses.

The precious essence of roses, so celebrated in all parts of the civilized world, as one of the principal productions of the Indies, is made from flowers which grow abundantly in the fields around Gazypoor. Their cultivation however presents nothing romantick; it is merely a matter of business. Although the rose of India differs in size from our roses, yet its perfume is equally sweet. The Indian cultivators however, content themselves with nature’s productions as they find them. They never avail themselves of the resources of art. They regard the rose as a merchandise too costly to be cultivated for ornament, and for their purposes the natural rose is amply sufficient.

The roses of Gazypoor are planted in regular lines, in fields of several hundred acres extent, all around the city. Their purple flowers, which open to the rays of the morning sun, and enamel the green plains, present an agreeable prospect.

When the season for gathering had come, there are no bands of young maidens with garlands in their hair, to pluck the sweet-smelling flowers, but they are pulled by poor labourers, who merely look for their daily stipend.

In manufacturing the otto, the first operation is to distil the roses (goulaa biepaan, the essence obtained is deposited in large vases, which are exposed to the air during the night. Occasionally these jars are skimmed, and the essential oil, which floats on their surface is removed; this oil is that concentrated essence so much prized by amateurs, and which is termed otto (atta) of roses.

The rose water which is deprived of its essential oil is much inferior and much less costly than that which has preserved it, but it is said that the difference between the two is barely perceptible. Rosewater is used universally by East Indians in their domestick economy. It is employed for ablutions, for a medicine, and in their cookery. It is poured on the hands at the commencement of a repast, and is taken internally for every disorder.

While I was passing over the plains of Gazypoor, with my companions, our huntsman suddenly shouted ‘An antelope! An antelope!’ and on looking I saw one of these animals rapidly descending from a mountain. We immediately gave chase, and truly animated was the scene: our fiery horses with their necks extended, their mouths foaming, and rivaling the antelope in swiftness, added not a little to the picture. Soon however the animal grew fatigued, his pace slackened, his legs trembled, and he seemed ready to drop down; when tame lynx, which had been educated for the business, jumped from behind a huntsman, threw itself on the head of the antelope, and soon destroyed it, amidst the shouts of my companions.

After this we returned to Gazypoor and took dinner in a large oriental saloon”.

Again, in “Indian Industries” by A.G.F. Eliot James, 1880 (Google Book pg 368): The trade in attar of roses is one which employs a great number of people. The roses of Ghazeepore came, it is said, originally from Bussorah. They were first of all transplanted from Persia, and brought to the now ruined city of Kannauj on the Ganges, from thence they were moved to Ghazeepore, about a century ago. Since that time the rose gardens have been rapidly extended, the celebrity of the perfumes prepared from the Ghazeepore roses spread throughout India, and gradually reached other countries, and year after year traders came from long distances and set up temporary distilleries in order to keep up their stock of this rare perfume. At Ghazeepore the roses are planted in large fields, the plants being raised from cuttings – not by grafting - which are planted out from the nurseries in which they are grown when they are a year old. They are planted in the field about three feet apart, and have to be kept perfectly clean by frequent weedings, the soil also being stirred and loosened around their roots. The flowering season is in February and March, and the average yield of flowers per beegah is from 30,000 to 60,000. These are bought by the distillers at prices varying from 100 to 125 rupees per lakh of flowers. In Ghazeepore there are about 200 acres of ground under rose cultivation, the rent paid averaging about 4 rupees per beegah. Gootabee pani, as the natives, call rose water, is very highly valued in India. That which has been skimmed is inferior to that which retains the essential oil floating on its surface; for this oil contains the concentration of aroma so much esteemed. This attar or oil of roses is collected in phials, and is sold by weight at 100 to 125 rupees per tolah.

Unfortunately Ghazipur, as it is now called, in the Murshidabad district of West Bengal State is no longer mostly devoted to rose growing, in fact there seem to be just a handful of families in the rose water business.

The Muslim system of medicine, called Unani, also uses roses in its various parts in the compilation of drugs.

When the British came to India in the 17th century, originally as a trading company, called The East India Company (later they took over the reins of government from the Mughal kings) their ships from China carrying merchandise - tea and opium - to England, stopped for refueling at the port and capital city of Calcutta, on the east coast of India.

Nearly every ship would carry live plants, including roses, which were becoming popular in England and France, and they would be kept in the Botanical Gardens at Howrah, (called the Company's Garden) a suburb of Calcutta on the banks of the River Hooghly, a tributary of the River Ganges, to recover before continuing on their journey to England, going round the Cape of Good Hope in South Africa.

Some plants from each batch would be planted down in this botanical garden which was started by Sir William Roxburgh in 1793. Records show that roses came to the garden around 1794, and Roxburgh's book, "Flora Indica", Serampore, 1832, mentions that in 1832 the species *R. glandulifera, semperflorens, recurva, diffusa, microphylla* and *triphylla, inermis, involucrata, chinensis, centifolia,* and *pubescens* were growing there.

'Fortune's Double Yellow' as well as other Chinas and Early Teas too were in residence in this garden. Many of them are still available in old nurseries and gardens in India, though they are now nameless, have names mauled beyond recognition, or have acquired names other than the ones assigned them after they reached their final destination -- England. 42)

In fact. *R. laevigata*, first mentioned in Chinese medical literature about 740 A.D., seems to have been introduced to the U.S. by the East India Company in 1759 - where it became the 'Cherokee Rose'.

Gavin Menzies in his book, “1421” page 240, says: “In 1803, European settlers found a beautiful fragrant rose growing wild; they named it the Cherokee Rose. Yet it was indigeneous to south east China and had been illustrated in a 12th century pharmacopoeia. “When and by what means it reached America is one of the unsolved problems of plant introductions” (Article by Dr. Tan Koolin in the “Rose” (Journal of the American Rose Society) Vol. 92, Pt 4; R.E. Shepherd “History of the Rose” Macmillan, New york, 1954; E.Wilson “Plant Hunting”, Vol 2., Stratford, Boston, Mass., 1927.)

In the chapter, 'Arrival of the British' Ray Desmond in “The European Discovery of Indian Flora” says: "The Reverend Edward Terry (1590-1660) chaplain to Sir William Roe during his embassy to Jehangir from 1615-1619, is less observant" (than William Finch who was a member of William Hawkins 1608 mission) “more cursory in his reaction to plants. Among 'the graet varietie of faire goodly trees' only the banyan prompted a moment's pause. The flowers, by and large, disappointed him. “They rather delight the Eye, then affect the Sense, in colour admirable but few of them, unless Roses, and one or two kinds more, that are any with fragrant” (taken from S. Purchas (1905) “Hakluytus posthumus or Purchas his pilgrimes” Vol 9, pg 20. [42a)]

In the chapter 'Other Botanical Gardens' Desmond writes: "John Forbes Royle (1798-1858) took charge of the Saharanpur Botanical Garden. He reported to Wallich (Royle to Wallich. 7th April 1826. I.O.L.R. F/4/995 item 27123(2) folio 115: “Rhododendrons and oaks covered with ivy are the most common trees, white roses and brambles, barberries and raspberries the most frequent shrub, while violets and wild strawberries form the sward" [42b)]

On the Dapuri Botanical Garden, Desmond says: "The house and gardens belonged to Col. Forde and in 1828 they were purchased for the Governor of Bombay, Sir John Malcolm. 48 acres of botanical garden was to be created. Nicol Alexander Dalzell (1817-1878) as supervisor transferred the garden to the new Government House at Ganeshkind (1865). Revenue was from the sale of roses, crotons and other ornamentals." [42c)]

Emma Roberts in her “Notes of an Overland Journey through France and Egypt to Bombay" pg. 278 says of the same garden "at the end of the flower garden a broad terrace overlooked a large tank or pool. Roses grew in wanton profusion." [42d)]

Vanquishing the Mughals, the British thereafter fought local Indian kingdoms in a policy of annexation.

An account has come down to us by a British soldier who fought in the Third Mysore War (1792) against Tipu Sultan, the King of Mysore at Seringapatam (both Seringapatam and Mysore are part of the present state of Karnataka in South India).

The soldier had seen Tipu’s magnificent Mughal style garden, called “Lal Bagh” (Red Garden), in all its glory. “Alas,” he wrote his father in England, “it fell sacrifice to the emergencies of war . . . . whole avenues of tall and majestic cypresses were laid low, nor was the orange, apple, sandal tree or even the fragrant bowers of rose and jasmine spared. . . . Fascines of rose bushes bound with jasmine were used … and the very pioneers themselves were scented.” 43)

Tipu built a wondrously beautiful summer house in Srirangapatnam called Dariya Daulat, which, fortunately is still in excellent condition, all thanks due to Col. Arthur Wellesley (who later became the famous Duke of Wellington). Later Lord Dalhousie, Governor General of India in the mid 19th century saw the palace and ordered that the building be kept in good repair and that the faded murals be restored by those who could recall them as they had been. The murals, now preserved by the Archaelogical Survey of India are boldly and colourfully done, gripping despite their lack of refinement... Bowring was able to see that the defeat of Baillie at Polilur, near Kanjeevaram in 1780 was “a most amusing caricature, that General being shown reclining helplesly in a palankeen, while Tipu on horseback is calmly smelling a rose and giving orders to his troops”. 43a)

While Tipu is smelling a pinkish white rose in the painting, the painted decorations around every doorway in the Dariya Daulat and a mural of a vase of roses in a niche in an internal room, are all of red roses.

Major Lachlan Macquarie (1761-1824) of the 77th Regiment was a member of Lt. Gen. James Stuart's general Staff, and visited Seringapatam in 1791, 1792 and finally in 1799, when Tipu was killed in battle. Macquarie kept a journal when he was in Seringapatam in 1792 and 1799. Whilst being a career soldier and interested only in the military aspects of the protracted war, and “sadly lacking in any detailed description of everyday life in India, or the dress, customs, festivals, religious beliefs, social aspects etc of the different parts of the subcontinent he visited, being typical of many of his generation of career soldiers in India who came only for profit and self advancement and did not delve too deeply into the richness of Indian culture.” (Mr Robin Walsh, Librarian of the Macquarie Library in Macquarie University, NSW Australia).

However, while writing in his journal on February 17, 1792 he says “I rode to the Pettah, the Palace, Hyder's Tomb and the Garden (called the 'Loll-Baug') on the island of Seringapatam, all which places are now in our possession and I was very highly gratified with the superb magnificence and grandeur of these Places; particularly so indeed, with the elegance of Tippoo's New Palace in the Loll-baug which is only yet about half finished". 43b)

Tipu Sultan had two Lal-Baghs, the destroyed one in Seringapatam and another, which exists to this day, in Bangalore, and they were so called, not because of the red stone used, but for the red roses featured everywhere in the gardens.

Francis Buchanan in his “A Journey from Madras through the Countries of Mysore, Canara and Malabar” (1807, reprint AES 1999) Vol.1 pg 74, condemns the crudely executed illustrations in the 'Durria Adaulat Baugh' by supposedly the best artists of the time, but, as, Kavita Watsa in “Brahmins and Bungalows - travels through south India” penguin Books, 2004 says:

"Really this is most misleading, and rather unkind of the Company-sponsored writer, for the paintings of the Dariya Daulat, now preserved by the A.S.I. are boldly and colorfully done, gripping despite their lack of refinement. Even if one condemns them on technical grounds, only the stuffiest viewer would fail to appreciate their value as period art."

Francis Buchanan was the same as Francis Buchanan Hamilton who became later Surgeon general to the Governor General at Calcutta and who travelled widely in eastern and northern India, and discovered in Nepal, *Rosa clinophylla* (called *involucrata*). He was Superintendent of the Calcutta Botanical gardens for a year in 1814 (ill health forced him to return to England).

What could Tipu Sultan’s red roses have been? South Indian kingdoms from the 5th century A.D. had maritime links with both eastern countries like Cambodia, Malaya and China, as also with western countries like Arabia and Rome, and in succeeding centuries, trade with China particularly was well organized. It is possible therefore that the legendary red roses of Lal-bagh were China roses, of the repeat-flowering kind, as once-flowering types would most likely not have flowered in the climate of Mysore, where winters are very mild.

In the 1800’s, Indian rose history belongs to the Europeans, mostly to British botanists and administrators whose work sent them far and wide over the subcontinent to record and categorize for the west the wealth of plants it contained.

R. clinophylla, first collected by Francis Buchanan Hamilton in 1803 and sent to Roxburgh at the Calcutta Botanical Garden, had, by the time Lindley in 1820 called it *R. involucrata* (the name Roxburgh gave it), already reached France, where Thory described it in the first volume of Redoute’s ‘Les Roses’ (1817) and where it also was illustrated. 44)

A Mrs.Gore, who wrote “The Book of Roses - A Rose Fanciers Manual” in 1838, and who obviously lived in Calcutta, has this to say about *R. clinophylla* (*involucrata*): ”The parched shores of the Gulf of Bengal are covered, during the spring, with a beautiful white rose, found also in China and Nepal. The flowers of the *Rosa involucrata* are white, solitary, surrounded with a collar of three or four leaves, out of which they seem to emerge; while in vast thicket of the beautiful *Rosa semperflorens* (a native also of China) the tigers of Bengal and crocodiles of the Ganges are known to lie in wait for their prey.” 45)

R. gigantea, the ‘Empress Rose’ as Graham Stuart Thomas and others have called it, was discovered by Sir George Watt in Manipur (northeast India) in 1882. But it was introduced by Sir Henry Collett in 1888, who sent seeds to the Calcutta Botanical Garden, and from there to Kew. (46)

A plant of *R. lyelli* (kuzah, or ‘koozah’ as the English would have it) was sent by Dr. Wallich to Sir Joseph Banks from Nepal and described in 1820 by Lindley. Crépin, the Belgian rhodologist, considers this to be a cross between *R. clinophylla* and *R. moschata*, though “nothing can be more ornamental than the double white rose of North India and the Deyra Doon, *R. lyelli*, the koorza of the natives.” (47)

The Agri-Horticultural Society of India, based in Calcutta, in the state of Bengal, was started in 1820, and, from the 1830’s regular rose shows were held. There are many records of correspondence between members on the nomenclature and names of roses. Many loyal Bengalis (people of the state of Bengal) feel that the “Bengal roses” originated in Bengal and were not so called, as indeed they were, because they were the Chinese roses passing through from China to Europe via Bengal. But, as Graham Stuart Thomas states, ”*R. chinensis* Jacq. also called *R. bengalensis* Pers. The westward spread of the China roses must have begun at a comparatively early date, for they seem to have been common in the gardens of India when the sub-continent started to be botanised towards the end of the 18th century. But it is doubtful if the China roses were ever quite so much at home in Bengal as the French rosarian Boitard suggested in his “Manuel Complet” (1836). (48)

That lavish use of rosewater continued on ceremonial and other occasions is vouchsafed by this note in Fanny Parkes Journals called "Begums, Thugs and Englishmen: The Journals of Fanny Parkes" selected and introduced by William Dalrymple, Penguin Books 2002. page 245: "April 12th 1835: One of the attendants presented us with paan, whilst another sprinkled us most copiously with rose water. the more you inundate your visitor with rose water, the greater the compliment" Mrs Parkes was visiting Her Highness Baiza Bai, widow of the late Maharaj Daulat Rao Scindia, (a Mahratta) who was under the 'protection' of the British in Fatehgarh.

Mrs Fanny Parkes also comments on the rose water of Kannauj which she pronounces 'Very fine' (page 258). And on page 261 she says "rose water, paan and atr of roses having been presented (to Baiza Bai) I took my leave".

In “India” by Fanny Roper Feudge, Estes & Lauriat, Rockwell and Churchill, 1881, is written: “The ceremony of attar and pan, that always concludes an Indian ‘Durbar’, i.e. a full dress reception given by a sovereign or personage of exalted rank – is, at this court performed with more than the ordinary expenditure of royal munificence. Each guest receives a dainty handkerchief of delicately embroidered Indian muslin, which he places folded on the palm of his right hand; then the Maharajah rises, and going forward to each in turn, pours attar of roses on the handkerchief, and presents the visitor with betel nut, curry leaves and cardamoms;

at the same time throwing about the neck a garland of Jessamine or tube roses fastened with a string of small pearls"

In "Engaging Scoundrels, True Tales of Old Lucknow" by Rosie Llewellyn-Jones, OUP, 2000, describing Lucknow gardens, she writes, pages 23-25: "'Hawa khana', literally to 'eat the air', is the descriptive Urdu phrase for taking a stroll or a ride in the open air, usually in the early morning or the evening. Lucknow has been called the 'City of Gardens', and though some have been lost to encroachment or development, others remain as one of the most enduring of the Nawabs' legacies. Spectators could watch the Nawabs bowling along in their English carriages, with an English footman in attendance, on their way to the gardens to 'eat the air' with their courtiers. The baghs or gardens, were private areas, surrounded by high walls so that the royal ladies, in strict purdah, could not be glimpsed by passers-by. Many of the gardens' names are still used today, even when later buildings have completely swallowed up the original site, like the Charbagh, with its once 'noble gateway embosomed in a wood' and its 'massive folding doors'. Some of the gardens were created by the Nawabs' ministers, like the Gulab Bari of Amin-ud-daula, Wazir to Amjad Ali Shah, where English rose cuttings were grafted on to the sweet-scented Indian variety. Across the river, which by the 1840's had two bridges, the 'Stone Bridge' (really made of brick) and a bridge of boats, lay several extensive gardens and parks. The Ramna Qaisar and Hazaree Bagh, scenes of animal fights... and there was also the Nasiree Bagh, which was 'a small garden in the French style, with a summer-house, adorned, or rather overladen, in a very tasteless manner, with articles of glass, china, bad paintings, copper-plates, and all sorts of bagatelles'.

The Nawabs' gardens, like their palaces, reflected the eclectic tastes of their owners and Lucknow had a number of foreign gardens. In contrast to the French-inspired Nasiree Bagh, Captain Leopold von Orlich found the nearby Padshah bagh "a large and beautiful garden, laid out in the English style, and uncommonly delightful. A bason with many fountains intersects the garden in its whole length (but the effect of the natural beauties of the spot is spoiled by the mahy painted statues, models of sandstone after the antique, etc., which, by the King's orders, have been daubed with a dirty red colour, and produce a most disagreeable impression. At the further end of the garden are two pretty summer-houses with marble baths, and vapour baths, connected with a spacious harem, which consists of a quadrangular building, the windows and doors of which are towards the inner court. This edifice is so situated, that the King can see the amusements of the ladies from the colonnade of the palace……" ("Travels in India Including Sinde and the Punjab" by Captain Leopold von Orlich, translated by H.E. Lloyd, 2 vols., London 1845 ii p.96).

"There were formal Persian-inspired gardens where the central axis is usually occupied by a marble tank, in which many fountains are playing, and cypresses alternate with roses in embellishing its margin" and gardens "in the old-fashioned style, full of orange and lime trees, flowering shrubs, and flowers, all the year round in succession, except the hot winds; interspersed with statues and vases" ("The Asiatic Journal and Monthly Register for British India and Its Dependencies", Vol.II, June-December 1816, Article entitled 'Recent Notes on Lucknow'p.578).

"Asaf-ud-daula's first gardens, within the courts of the Macchi Bhawan palace were divided into parterres by walls and fountains. Along the side walls runs a corridor, forming one continued arbour of vines, which shades its whole roof". ("Account of Lucknow from Gladwin's Asiatic Miscellany" reproduced in "The Asiatic Annual Register for the Year 1800" under 'Miscellaneous Tracts 1785', pp 97-110).

"There was a pleasant synthesis in the Nawabs' gardens where the symmetrical Mughal layouts echoed the old French parterres, which were still popular in India well into the 19th century. The addition of garden statuary, which was not of course Islamic, was probably inspired by Claude Martin's profuse use of classical figures on his buildings and in his own French garden in Constantia. The 18th century English picturesque gardens with their baroque walks and unexpected vistas, popularized by Capability Brown and Humphrey Repton were much harder to create in India, with its extremes of climate, an perhaps there was an unspoken idea that this kind of soft, romantic landscape would not convey the right impression for the Company's stern men of duty. True, some British officers, who had been given the Charbagh by Wajid Ali Shah had planted some fruit trees, and made it into a pleasant orchard, but it was the Nawabs who ordered the fantasy gardens and landscapes, two of which must have been particularly charming and imaginative. Near the Dilkusha palace was a short-lived 'English; village of which only the ruins of some mud huts remained by 1827 and at the Daulat Khana palace there was a Chinese garden, whose tall pagoda was still visible in 1858, similar to the one in Kew Gardens. There were a number of Chinese men at the Lucknow Court: 24 were recorded among the Nawab's staff in 1831, and it is tempting to think they may have built the pagoda, at the height of the European craze for Chinoiserie." ("The Asiatic Journal & Monthly Register", pg 579).

"Of the flowers themselves, apart from the roses, we can be fairly certain they included sweet scented bushes like rat-ki-rani (queen of the night), jasmine, frangipani, and the ubiquitous poinsettias, marshaled into line by the malis. Dr. Nathaniel Wallich, the Danish Superintendent of the Calcutta Botanical garden had sent some rare plants up for the King in 1826, but we do not know what they were. A well meaning attempt by the Resident to get Mr. Mitchell, an English botanist, to instruct the King's gardeners foundered after a few months when the botanist left, though other Englishmen were put in charge of the royal gardens by Nasir-ud-din Haider. Their role however was more nominal and these 'superintendents' were not expected to get their hands dirty, anymore than the Nawabs would have been found weeding a flower bed.”

“Photographs show the Qaisarbagh gardens probably much as the last King had left them, and confirm the description of a newspaper reporter who had got in during the annual fair when Wajid Ali Shah opened the main area to the public for a few days. The garden is tastefully laid out with marble statues, arranged in curiously outré groupings, Venus and Cupid and in juxtaposition an English cow, not a bad specimen of the statuary’s skill. Then we witness a magnificent marble reservoir where gold and silver fishes disport undisturbed, also fountains of marble which play unceasingly’. Also here was a barahdari, a light, open building where musicians and dancers could perform, and a beautiful Mughal inspired marble pavilion. (This was subsequently dismantled by the British and re-erected in Banarsi Bagh where it has recently been nicely restored)”.

In “Notes of the Visits to India of…”

“The weather is splendid. Lucknow is looking its best, and may certainly claim to be the most beautiful station in India. The garden of Wingfield Park, produces the most exquisite flowers, the roses are especially fine, nearly 120 varieties are produced, and all of the best description. Dr.Cannon, the Civil Surgeon, has devoted much attention to them, with the result of producing the finest roses in India.”

Lord Curzon had a rose pergola in the Vice regal Lodge in Simla. "Roses, from the time of the first Mughal Emperor and possibly earlier, are still everybody's favourite: they bring colour in May to Kashmiri gardens and are striking sentinels to the entrances of Delhi's hotels in December." [48a)]

Taken from Thomas Lowe's book "Central India During the Rebellion of 1857 and 1858" page 218 of Chapter V. Defeat of the Rajah of Shahgur-fort and Garden of Sorai.

"The fort was very filthy and full of rubbish. A more lovely place than this garden could not well be imagined for a country like India without giving something of a picture of what it was when we resided in it, while the work of destruction was being carried on in the fort. In the centre of this extensive enclosure was the seraglio of the Rajah, overshadowed by mango and guava trees and embowered by groves of orange and citron trees, laden with golden fruit and sweet smelling blossoms.

In front of the doorways were jessamines and myrtle, and roses, oleanders and camellias and pomegranates in full bloom and interesting and tastefully laid out flowerbeds, reaching away on all four sides were variegated poppies and marigolds, verbenas, hollyhocks, lilies, feathery larkspurs, interspersed with little plots of sweet smelling thyme, mint, borage and Damascus roses, and in and out of these beds, partridges, mynahs and parrots strutted and fluttered about as though they alone were the lords of this little Elysium.

Then there were bowers of roses and jessamines and further off, clusters of orange and citron and peach trees, all in blossom, hedged in by long lines of rose bushes, then beyond these were beds of 'Windsor beans', trelliswork covered with French beans; then onion, lettuce, beetroot and asparagus beds, long rows of plantains and a host of other good vegetables for the table. The whole was enclosed by fine tamarind and mango trees in which scores of monkeys kept a constant hoo-hooing".

Obviously Raja Bakht Bali of Shahgarh kept a wonderful garden. It seems so sad that there is absolutely no record of this.

This Raja was an important member of the Indian rebellion of 1857 against the British. He, along with Raja Mardan Singh of Banpur, Adil and Fazil Muhammad Khan of Ambapani, Bakhtawar Singh, raja of Amzhera and Narayan Singh, the Zamindar of Sonakhan waged war against the British (1857) (www. centralchronicle.com/2006`11223/2312030.htm nand sat. Dec 23, 2006 – Rare Archives Exhibition on the Net – no longer available)

Thomas Lowe, in his book, "Operation of the British Army in Central India During the Rebellion of 1857 and 1858" ISBN 1843422522 (taken from Fullbooks.com on the Net) has this to say, (page33-36) about the town of Aurangabad:

"I visited the very beautiful Taj in its vicinity (built by Aurangazeb for his daughter). This tomb stands enclosed in the centre of what was once an extreme garden of roses and other beautiful flowers but now little better than a garden of weeds and jungle plants".

In the "Journal of Horticulture, Cottage Gardener and Country gentleman" August 16, 1865, pg 127, is this article written by someone calling himself 'Tea Rose':

'Gardening in India'

"Perhaps it may interest your readers to hear something of the plants usually seen in gardens in India. I shall speak only of central India and the North West provinces, Bengal presidency. And first about Roses.

There are not many roses generally known. I had but 14 kinds and few people I believe, were in possession of half that number. I had pink and crimson China, white and pink Gallica (from which rose water and attar are produced), the Bourbon (called in India 'Rose Edward'), Multiflora, Microphylla, Dog Rose, Hill rose (a beautiful evergreen double white climber), white and yellow Tea scented Musk, a very small cluster Rose blooming only in hot steamy weather, and the double yellow Cashmere Rose. This did not bloom well with me, but judging from the leaf, I suppose it to be the 'Persian Yellow'.

The Tea Rose is worth all the others put together. I only speak of the white –

'Devoniensis'. I think it was; the yellow had not bloomed for me before I left India. From November to April, the Tea Rose was a picture of beauty. During the hot season it was not worth looking at, but in the cold nothing could exceed its beauty and luxuriance. I took notes of one that I had especially cared for. When two years old, it was four feet in height and 13 in circumference. One morning in February I counted 91 blossoms fully opened. The centre of some was blush, of others yellow, and those a day old were edged with the loveliest lilac. The buds were innumerable - I should rather say I became tired of reckoning them when the number reached 600. There certainly were more than double that number. A native in charge of one of the public gardens came one day to see one of my Tea Rose Trees. He went on his knees to examine it, and for some minutes said nothing but ‘How beautiful! How beautiful! it is’. He was really fond of flowers and had never seen it before. I wish I could make Tea roses grow with me now, but they constantly die off. I suppose I cannot get out of the Indian way of treatment.”

'Tea Rose’

The Botanical Garden in Ootacamund (now called Uthagamandalam) was started in 1894, and at its inauguration, this inscription was put:

Roses For The Garden

Roses are the gift of price,
Sent to us from Paradise.
More Divine our nature grows
In the Eden of the Rose.

Roses why for silver sell
O rose merchant fairly tell.
What you buy instead of those
That is costlier than the rose?

Kisa'i of Merv

Kisa'i of Merv was a well known and singularly graceful Persian poet, who flourished in the latter half of the 10th century. "Of all the innumerable tributes which Persian poets have offered to the rose, I know of none so charming a these lines by Kisa'i" says the author of a book which talks in its first chapter on 'An early Persian Antholgy called *Lubabu'l-albab* by Muhammad Awfi'. It is the first biography of Persian poets. 49)

Frederick Price in “Ootacamund, A History” (1906, reprinted 2002 by Rupa paperback) asks: "When and by whom was the first cultivated rose brought to the Hills? This is a question which cannot be answered. Persia was, as far as anything written goes, the first country indented upon for this flower, and the white and pink Persian roses which are common enough in gardens at Ootacamund are very possibly the descendants of plants brought from that country in 1831, on the indent sent by Mr. Lushington (Governor of Madras 1827-1832). The pink cluster rose which, in the shape of hedges, abounds about all the settlements on the Nilgiris was brought from China in 1843. It is, I believe, really a native of Japan. By far the greater part of the good varieties of roses to be found on the Hills have been imported within the last thirty years. The common pink rose of the plains will not live on the upper plateau."

Many women writers in colonial India write about roses in their accounts of a ’mem sahib’s’ life in this country.

In “The Diary of a Civilian’s Wife in India”, 1877- 1882, Vol. 2, published in 1884:

“April 1. - Heigh ho! For the roses. They are so beautiful that they make me feel sad. You do not understand this? Neither do I, but it is none the less quite true. They are now in their glory, and blooming in such quantities that we hardly know how to dispose of them. We send basketsful to neighbours who have none, and fill every bowl and vase we have, with great creamy roses, and tea roses, and blush roses, and huge yellow 'Maréchal Niels', and still there are more, and their fate is to be eaten by the fawn, who enjoys them as much perhaps in his way as I do in mine. Roses never grow in England in the joyous, lavish way they do here. They are an exquisite pleasure, but one I can only enjoy indoors, as the heat now is too great by nine o’clock for me to venture out.”

In the diary of Catharine Grace Loch, Royal Red Cross, Senior lady Superintendent, 1905 :

“April 10 – The station is now a mass of roses. My tubs of roses are all over flower, pink La France, and red ones too; even the young plants are making some flowers, and a 'Maréchal Niel' and another yellow rose are full of flowers, so the ruthless cutting-in I gave them all has been successful. A great many gardens look like snowstorms. The Mardan roses are all out; they are an enormous, single, pure white flower with glossy green leaf, very beautiful. I wish I could take a plant of it home, but I do not know how to.”

During the British period, maharajas like those of Mysore, Jammu and Kashmir, Baroda, Gwalior, the Nawab of Bhopal, the Nizam of Hyderabad, the Maharanas of Indore, Udaipur, the Rajas of Travancore, Cochin, Jodhpur and the Maharana of Kutch were ‘Members of the Order’ or ‘Knights Grand Commander’

The collar worn only by the Knights Grand Commander was made of gold. It was composed of alternating figures of lotuses, red and white roses and palm branches with an imperial crown in the centre. (Taken from: https://web.archive.org/web/20060420215715/http://www.boloji.com/business/003.htm

Lakhnavi Itar by Rajsaran Varma)

In “Personal Observations on Sindh: The Manners and Customs of its inhabitants and its Productive” by Thomas Postan (AES Print, ISBN 8120617185) Page 101 Chp.VI ‘On Sindh”:

“The fruits of Sindh are the date, mango (very good) apple (inferior), pomegranate, limes, oranges, citrons, mulberries, tamarind, melons of every description, many of the fine sorts for which Candahar and Cabul are famous, pistachio nuts, jambu or wild plum, grapes, plantains etc. near Shikarpur, and on the eastern bank near Rori, and at Hyderabad, the gardens are very luxuriant and at the beginning of the hot months the whole country is well supplied with flowers particularly roses. All classes take great pleasure in having large gardens wherein are passed hours of relaxation. Mohammedans and Hindus alike spend much money and bestow great attention on this pursuit”.

Unfortunately, with modern day roses being easily available, interest in these old beauties - these heritage roses - has grown lukewarm. However, rose rustlers like my husband and myself have been scouting around, searching for these old varieties, and trying to enthuse others to collect these rarities before they disappear. We have assembled a large collection and we have been able tentatively to name most of them, after looking at descriptions and photographs in old rose books.

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